Computer algebra independent integration tests

Summer 2022 edition

5-Inverse-trig-functions/5.1-Inverse-sine/143-5.1.4-f-x-^m-d+e-x^2-^p-a+b-arcsin-c-x-^n

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September 27, 2022 Compiled on September 27, 2022 at 2:36am

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Chapter 1

Introduction

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This report gives the result of running the computer algebra independent integration test.

The download section in the appendix contains links to download the problems in plain text format used for all CAS systems.

The number of integrals in this report is [703]. This is test number [143].

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

1. Mathematica 13.1 (June 29, 2022) on windows 10.
2. Rubi 4.16.1 (Dec 19, 2018) on Mathematica 13.0.1 on windows 10.
3. Maple 2022.1 (June 1, 2022) on windows 10.
4. Maxima 5.46 (April 13, 2022) using Lisp SBCL 2.1.11.debian on Linux via sagemath 9.6.
5. Fricas 1.3.8 (June 21, 2022) based on sbcl 2.1.11.debian on Linux via sagemath 9.6.
6. Giac/Xcas 1.9.0-13 (July 3, 2022) on Linux via sagemath 9.6.
7. Sympy 1.10.1 (March 20, 2022) Using Python 3.10.4 on Linux.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 on windows 10.

Maxima and Fricas and Giac are called using Sagemath. This was done using Sagemath `integrate` command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly from Python.

1.2 Results

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

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

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

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

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

System	% solved	% Failed
Rubi	100.00 (703)	0.00 (0)
Mathematica	98.72 (694)	1.28 (9)
Maple	78.81 (554)	21.19 (149)
Fricas	37.70 (265)	62.30 (438)
Maxima	37.70 (265)	62.30 (438)
Giac	34.00 (239)	66.00 (464)
Sympy	29.59 (208)	70.41 (495)
Mupad	20.77 (146)	79.23 (557)

Table 1.1: Percentage solved for each CAS

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

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

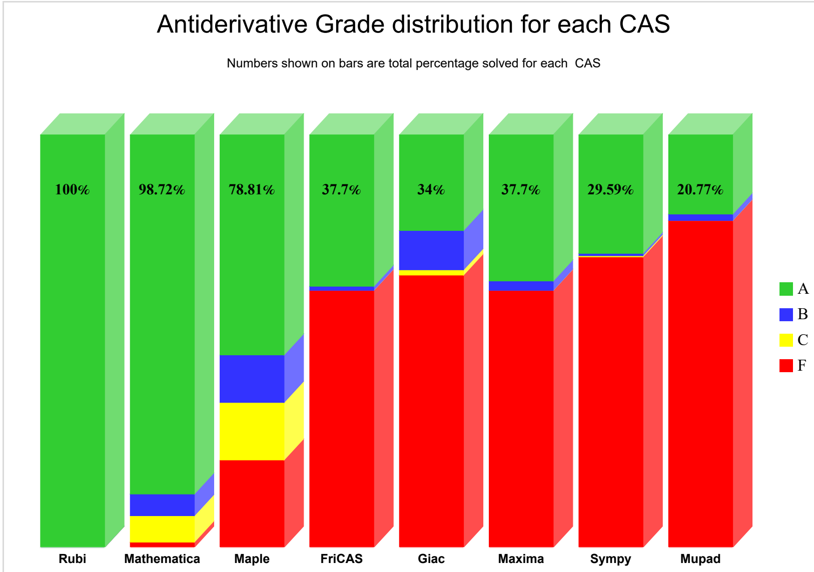
Table 1.2: Description of grading applied to integration result

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

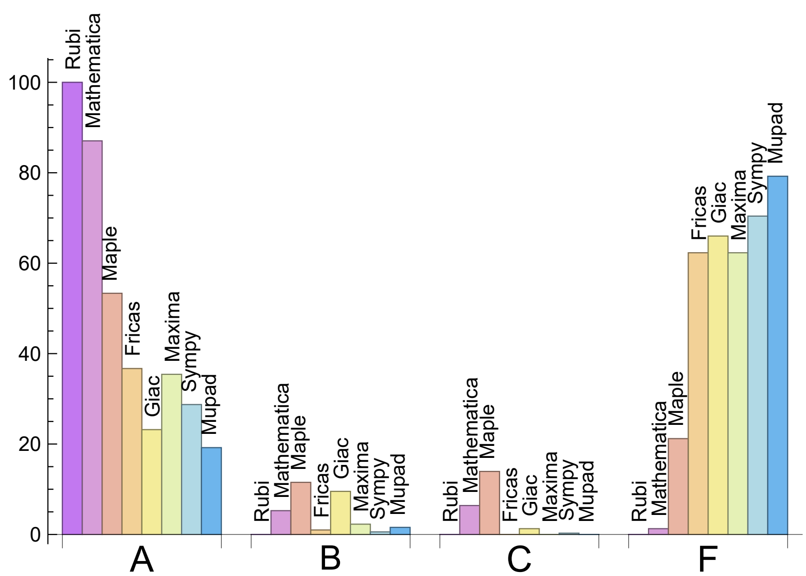
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	87.06	5.26	6.40	1.28
Maple	53.34	11.52	13.94	21.19
Fricas	36.70	1.00	0.00	62.30
Maxima	35.42	2.28	0.00	62.30
Sympy	28.73	0.57	0.28	70.41
Giac	23.19	9.53	1.28	66.00
Mupad	N/A	1.56	0.00	79.23

Table 1.3: Antiderivative Grade distribution of each CAS

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



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



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

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

The third is due to an exception generated. Assigned **F(-2)**. This most likely indicates an interface problem between sagemath and the CAS (applicable only to FriCAS, Maxima and

Giac) or it could be an indication of an internal error in CAS. This type of error requires more investigations to determine the cause.

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	0	0.00 %	0.00 %	0.00 %
Mathematica	9	100.00 %	0.00 %	0.00 %
Maple	149	100.00 %	0.00 %	0.00 %
Fricas	438	85.16 %	0.00 %	14.84 %
Giac	464	61.64 %	3.23 %	35.13 %
Maxima	438	88.81 %	0.00 %	11.19 %
Sympy	495	77.58 %	10.71 %	11.72 %
Mupad	557	100.00 %	0.00 %	0.00 %

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

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

Mean size is the average leaf size produced by the CAS (before any normalization). The Normalized mean is relative to the mean size of the optimal anti-derivative given in the input files.

For example, if CAS has **Normalized mean** of 3, then the mean size of its leaf size is 3 times as large as the mean size of the optimal leaf size.

Median size is value of leaf size where half the values are larger than this and half are smaller (before any normalization). i.e. The Middle value.

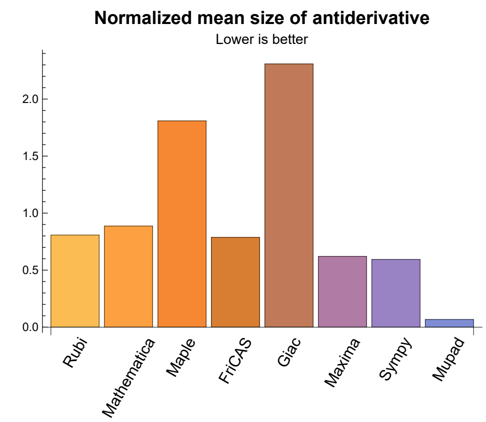
Similarly the **Normalized median** is relative to the median leaf size of the optimal.

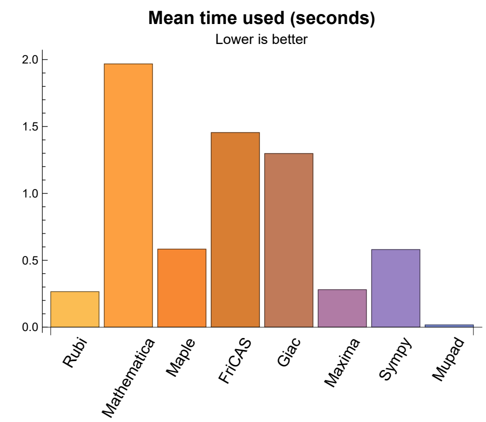
For example, if a CAS has Normalized median of 1.2, then its median is 1.2 as large as the median leaf size of the optimal.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.27	226.86	0.81	189.00	1.00
Mathematica	1.97	245.72	0.89	168.00	0.84
Maple	0.58	508.46	1.81	235.50	1.34
Maxima	0.28	113.71	0.62	32.00	0.62
Fricas	1.45	135.58	0.79	55.00	0.75
Sympy	0.58	106.71	0.59	0.00	0.00
Giac	1.30	416.10	2.31	70.00	1.01
Mupad	0.02	1.84	0.07	-1.00	-0.03

Table 1.5: Time and leaf size performance for each CAS

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


Normalized mean size of antiderivative
Lower is better
0.0
0.5
1.0
1.5
2.0
Rubi
Mathematica
Maple
FriCAS
Giac
Maxima
Sympy
Mupad


Mean time used (seconds)
Lower is better
0.0
0.5
1.0
1.5
2.0
Rubi
Mathematica
Maple
FriCAS
Giac
Maxima
Sympy
Mupad

1.4 list of integrals that has no closed form antiderivative

$\{146, 147, 148, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 302, 314, 315, 321, 322, 323, 324, 329, 330, 331, 332, 337, 338, 339, 340, 347, 348, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 377, 378, 380, 385, 386, 387, 388, 389, 394, 395, 396, 397, 398, 403, 404, 405, 406, 407, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 435, 440, 445, 446, 450, 454, 458, 459, 463, 469, 470, 475, 476, 480, 481, 485, 486, 490, 491, 495, 496, 497, 502, 503, 649, 650, 657, 658, 664, 665, 666, 667, 671, 672, 673, 674, 675, 676, 680, 681, 682, 683, 684, 685, 689, 690, 693, 694, 698, 699, 702, 703\}$

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {192, 194, 198, 200, 201, 203, 207, 209, 252, 260, 545, 551, 557, 569, 570, 571, 572, 574, 575, 595, 646, 647, 648, 655}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

A verification phase was applied on the result of integration for `Rubi` and `Mathematica`.

Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative was correct.

Verification phase also had 3 minutes time out. An integral whose result was not verified could still be correct, but further investigation is needed on those integrals. These integrals were marked in the summary table below and also in each integral separate section so they are easy to identify and locate.

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

Since tests were run in a batch mode, and using an automated script, then any integral where Maxima needed an interactive response from the user to answer a question during the evaluation of the integral will fail.

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

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

Such integrals can be identified by looking at the output of the integration in each section for Maxima. The exception message will indicate the cause of error.

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

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

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

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

```
maxima_lib.set('extra_integration_methods', '[]')
```

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

1.9.2 Important note about FriCAS result

There were few integrals which failed due to SageMath interface and not because FriCAS system could not do the integration.

These will fail With error `Exception raised: NotImplementedError`.

The number of such cases seems to be very small. About 1 or 2 percent of all integrals. These can be identified by looking at the exception message given in the result.

1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

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

  except Exception as ee:
        leafCount =1
```

1.9.4 Important note about Mupad results

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

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

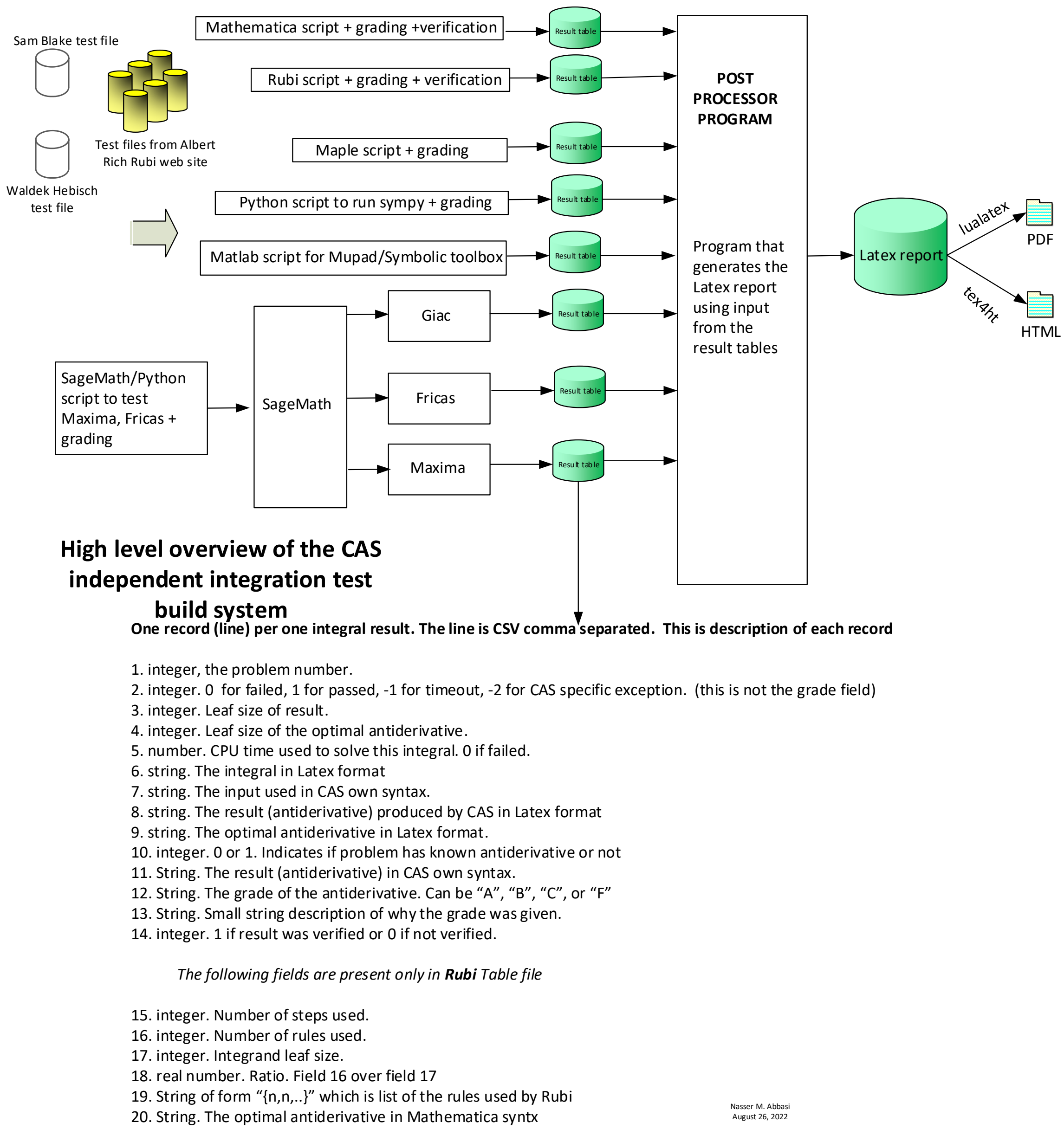
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



Chapter 2

detailed summary tables of results

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2.1 List of integrals sorted by grade for each CAS

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2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 33, 35, 37, 40, 42, 43, 44, 45, 47, 49, 51, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 120, 122, 123, 124, 125, 126, 127, 128, 129, 131, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 185, 186, 187, 188, 189, 190, 195, 196, 197, 199, 202, 204, 205, 206, 208, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 435, 440, 444, 445, 446, 449, 450, 453, 454, 457, 458, 459, 462, 463, 468, 469, 470, 473, 474, 475, 476, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 522, 523, 524, 525, 526, 527, 528, 530, 531, 532, 533, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 552, 553, 554, 555, 556, 558, 559, 560, 562, 563, 565, 566, 567, 569, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 589, 590, 592, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 637, 638, 639, 640, 641, 642, 643, 646, 647, 648, 649, 650, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 689, 690, 693, 694, 698, 699, 702, 703 }

B grade: { 29, 31, 32, 34, 36, 38, 39, 41, 46, 48, 50, 52, 184, 191, 192, 193, 194, 198, 200, 201, 203, 207, 209, 294, 521, 529, 534, 551, 557, 561, 564, 568, 570, 571, 588, 591, 593 }

C grade: { 119, 121, 130, 132, 431, 432, 433, 434, 436, 437, 438, 439, 442, 443, 447, 448, 451, 452, 455, 456, 460, 461, 464, 465, 466, 467, 471, 472, 477, 478, 651, 652, 653, 655, 656, 686, 687, 688, 691, 692, 695, 696, 697, 700, 701 }

F grade: { 276, 277, 278, 441, 635, 636, 644, 645, 654 }

2.1.3 Maple

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 48, 50, 52, 54, 65, 67, 81, 96, 97, 98, 99, 100, 101, 102, 103, 105, 106, 107, 108, 114, 115, 125, 127, 136, 138, 146, 147, 148, 156, 157, 158, 159, 160, 162, 164, 165, 166, 167, 168, 169, 171, 173, 174, 175, 176, 177, 178, 179, 180, 182, 184, 186, 187, 189, 191, 192, 240, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 293, 294, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 444, 445, 446, 449, 450, 453, 454, 457, 458, 459, 462, 463, 464, 468, 469, 470, 474, 475, 476, 479, 480, 481, 485, 486, 490, 491, 495, 496, 497, 501, 502, 503, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 649, 650, 657, 658, 661, 662, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703 }

B grade: { 42, 47, 49, 51, 53, 66, 82, 83, 104, 110, 112, 117, 161, 163, 170, 172, 181, 188, 190, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 214, 215, 216, 217, 222, 223, 224, 225, 230, 231, 232, 233, 235, 237, 239, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 634, 642, 643, 659, 660, 691, 692 }

C grade: { 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 109, 111, 113, 116, 118, 119, 120, 121, 122, 123, 124, 126, 128, 129, 130, 131, 132, 133, 134, 135, 137, 139, 140, 210, 211, 212, 213, 218, 219, 220, 221, 226, 227, 228, 229, 234, 236, 238, 295, 296, 297, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 635, 636, 637, 638, 639, 640, 641, 644, 645, 646, 647, 648 }

F grade: { 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 183, 185, 276, 277, 278, 292, 379, 441, 442, 443, 447, 448, 451, 452, 455, 456, 460, 461, 465, 466, 467, 471, 472, 473, 477, 478, 482, 483, 484, 487, 488, 489, 492, 493, 494, 498, 499, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 651, 652, 653, 654, 655, 656, 663 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 7, 9, 11, 12, 14, 16, 18, 23, 25, 27, 59, 60, 61, 62, 63, 64, 73, 74, 75, 76, 77, 78, 79, 80, 90, 91, 92, 93, 94, 95, 99, 101, 102, 103, 104, 105, 107, 109, 111, 113, 114, 116, 118, 121, 124, 126, 132, 133, 135, 139, 140, 146, 147, 148, 156, 158, 210, 212, 218, 220, 226, 228, 234, 236, 238, 239, 265, 267, 268, 272, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 298, 299, 300, 302, 304, 306, 307, 314, 315, 321, 322, 323, 324, 329, 330, 331, 332, 337, 338, 339, 340, 346, 347, 348, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 377, 378, 380, 385, 386, 387, 388, 389, 394, 395, 396, 397, 398, 403, 404, 405, 406, 407, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 435, 440, 485, 486, 490, 491, 495, 496, 501, 509, 525, 526, 527, 531, 532, 533, 536, 537, 538, 539, 561, 577, 582, 587, 588, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 649, 650, 657, 658, 659, 660, 661, 662, 664, 665, 667, 671, 672, 673, 674, 675, 676, 680, 681, 682, 683, 684, 685, 689, 690, 693, 694, 698, 699, 702, 703 }

B grade: { 10, 13, 19, 20, 21, 22, 40, 160, 165, 167, 169, 174, 176, 178, 195, 379 }

C grade: { }

F grade: { 6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 65, 66, 67, 68, 69, 70, 71, 72, 81, 82, 83, 84, 85, 86, 87, 88, 89, 96, 97, 98, 100, 106, 108, 110, 112, 115, 117, 119, 120, 122, 123, 125, 127, 128, 129, 130, 131, 134, 136, 137, 138, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 157, 159, 161, 162, 163, 164, 166, 168, 170, 171, 172, 173, 175, 177, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 211, 213, 214, 215, 216, 217, 219, 221, 222, 223, 224, 225, 227, 229, 230, 231, 232, 233, 235, 237, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 266, 269, 270, 271, 273, 274, 275, 276, 277, 278, 295, 296, 297, 301, 303, 305, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 349, 350, 351, 352, 353, 374, 375, 376, 381, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 408, 409, 410, 411, 412, 431, 432, 433, 434, 436, 437, 438, 439, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 487, 488, 489, 492, 493, 494, 497, 498, 499, 500, 502, 503, 504, 505, 506, 507, 508, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 528, 529, 530, 534, 535, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 578, 579, 580, 581, 583, 584, 585, 586, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 651, 652, 653, 654, 655, 656, 663, 666, 668, 669, 670, 677, 678, 679, 686, 687, 688, 691, 692, 695, 696, 697, 700, 701 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 25, 27, 40, 47, 49, 60, 61, 62, 63, 64, 73, 74, 75, 76, 77, 78, 79, 80, 90, 91, 92, 93, 94, 95, 99, 101, 102, 103, 104, 105, 107, 109, 111, 113, 116, 118, 119, 121, 123, 130, 132, 134, 146, 147, 148, 156, 157, 158, 159, 160, 165, 166, 167, 168, 169, 174, 175, 176, 177, 178, 195, 202, 204, 210, 212, 218, 220, 226, 228, 234, 236, 238, 264, 265, 266, 267, 268, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 302, 303, 304, 305, 306, 307, 314, 315, 321, 322, 323, 324, 329, 330, 331, 332, 337, 338, 339, 340, 346, 347, 348, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 377, 378, 379, 380, 385, 386, 387, 388, 389, 394, 395, 396, 397, 398, 403, 404, 405, 406, 407, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 457, 462, 474, 479, 485, 486, 490, 491, 495, 496, 497, 501, 502, 503, 509, 526, 527, 531, 536, 537, 577, 582, 587, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 649, 650, 657, 658, 659, 660, 661, 662, 664, 665, 666, 667, 671, 672, 673, 674, 675, 676, 680, 681, 682, 683, 684, 685 }

B grade: { 59, 634, 642, 643, 651, 652, 653 }

C grade: { }

F grade: { 6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 65, 66, 67, 68, 69, 70, 71, 72, 81, 82, 83, 84, 85, 86, 87, 88, 89, 96, 97, 98, 100, 106, 108, 110, 112, 114, 115, 117, 120, 122, 124, 125, 126, 127, 128, 129, 131, 133, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 161, 162, 163, 164, 170, 171, 172, 173, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 200, 201, 203, 205, 206, 207, 208, 209, 211, 213, 214, 215, 216, 217, 219, 221, 222, 223, 224, 225, 227, 229, 230, 231, 232, 233, 235, 237, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 349, 350, 351, 352, 353, 374, 375, 376, 381, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 408, 409, 410, 411, 412, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 458, 459, 460, 461, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 475, 476, 477, 478, 480, 481, 482, 483, 484, 487, 488, 489, 492, 493, 494, 498, 499, 500, 504, 505, 506, 507, 508, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 528, 529, 530, 532, 533, 534, 535, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 578, 579, 580, 581, 583, 584, 585, 586, 588, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 635, 636, 637, 638, 639, 640, 641, 644, 645, 646, 647, 648, 654, 655, 656, 663, 668, 669, 670, 677, 678, 679, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703 }

2.1.6 Sympy

A grade: { 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 25, 27, 99, 101, 102, 103, 104, 105, 146, 147, 148, 156, 157, 158, 160, 165, 166, 167, 169, 174, 175, 176, 178, 264, 265, 266, 267, 268, 279, 280, 281, 284, 285, 286, 287, 288, 289, 290, 291, 302, 303, 304, 305, 306, 307, 314, 315, 321, 322, 323, 324, 329, 330, 331, 332, 337, 338, 339, 340, 346, 347, 348, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 368, 369, 370, 371, 372, 373, 377, 378, 380, 385, 386, 387, 388, 389, 394, 395, 396, 397, 403, 404, 405, 406, 407, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 435, 440, 445, 446, 450, 458, 459, 463, 469, 470, 475, 485, 486, 490, 497, 502, 503, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 649, 650, 657, 659, 660, 661, 662, 664, 665, 666, 667, 671, 672, 673, 674, 675, 676, 680, 682, 683, 684, 685, 689, 690, 693, 694, 698, 699, 702, 703 }

B grade: { 159, 168, 177, 501 }

C grade: { 354, 413 }

F grade: { 6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 161, 162, 163, 164, 170, 171, 172, 173, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 282, 283, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 349, 350, 351, 352, 353, 367, 374, 375, 376, 379, 381, 382, 383, 384, 390, 391, 392, 393, 398, 399, 400, 401, 402, 408, 409, 410, 411, 412, 431, 432, 433, 434, 436, 437, 438, 439, 441, 442, 443, 444, 447, 448, 449, 451, 452, 453, 454, 455, 456, 457, 460, 461, 462, 464, 465, 466, 467, 468, 471, 472, 473, 474, 476, 477, 478, 479, 480, 481, 482, 483, 484, 487, 488, 489, 491, 492, 493, 494, 495, 496, 498, 499, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 651, 652, 653, 654, 655, 656, 658, 663, 668, 669, 670, 677, 678, 679, 681, 686, 687, 688, 691, 692, 695, 696, 697, 700, 701 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 40, 47, 99, 101, 103, 104, 105, 140, 146, 147, 148, 156, 158, 160, 166, 169, 175, 264, 266, 267, 268, 279, 280, 281, 285, 287, 288, 289, 290, 291, 302, 303, 305, 306, 307, 311, 312, 313, 314, 315, 319, 320, 322, 324, 328, 330, 332, 338, 340, 341, 343, 344, 345, 346, 347, 348, 350, 352, 353, 354, 356, 357, 359, 361, 362, 364, 366, 370, 371, 372, 373, 374, 375, 376, 377, 378, 386, 388, 395, 397, 404, 406, 407, 413, 415, 416, 418, 420, 422, 423, 425, 427, 429, 430, 441, 445, 446, 450, 454, 457, 458, 459, 462, 463, 469, 470, 475, 476, 480, 481, 501, 502, 503, 597, 599, 600, 609, 649, 650, 657, 658, 662, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 680, 681, 682, 683, 684, 685, 689, 690, 693, 694, 698, 699, 702 }

B grade: { 7, 9, 16, 18, 25, 49, 107, 157, 159, 165, 167, 168, 174, 176, 177, 178, 195, 202, 204, 316, 318, 325, 326, 327, 333, 334, 335, 336, 379, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 409, 411, 412, 596, 598, 602, 604, 605, 606, 607, 608, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 659, 660, 661, 677, 678, 679 }

C grade: { 464, 686, 687, 688, 691, 692, 695, 696, 697 }

F grade: { 6, 8, 15, 17, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 102, 106, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 161, 162, 163, 164, 170, 171, 172, 173, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 200, 201, 203, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 265, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 282, 283, 284, 286, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 304, 308, 309, 310, 317, 321, 323, 329, 331, 337, 339, 342, 349, 351, 355, 358, 360, 363, 365, 367, 368, 369, 380, 381, 385, 387, 389, 394, 396, 398, 403, 405, 408, 410, 414, 417, 419, 421, 424, 426, 428, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 442, 443, 444, 447, 448, 449, 451, 452, 453, 455, 456, 460, 461, 465, 466, 467, 468, 471, 472, 473, 474, 477, 478, 479, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 651, 652, 653, 654, 655, 656, 663, 700, 701, 703 }

2.1.8 Mupad

A grade: { 146, 147, 148, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 302, 314, 315, 321, 322, 323, 324, 329, 330, 331, 332, 337, 338, 339, 340, 347, 348, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 377, 378, 380, 385, 386, 387, 388, 389, 394, 395, 396, 397, 398, 403, 404, 405, 406, 407, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 435, 440, 445, 446, 450, 454, 458, 459, 463, 469, 470, 475, 476, 480, 481, 485, 486, 490, 491, 495, 496, 497, 502, 503, 649, 650, 657, 658, 664, 665, 666, 667, 671, 672, 673, 674, 675, 676, 680, 681, 682, 683, 684, 685, 689, 690, 693, 694, 698, 699, 702, 703 }

B grade: { 7, 105, 268, 307, 346, 354, 413, 430, 501, 602, 662 }

C grade: { }

F grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 303, 304, 305, 306, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 349, 350, 351, 352, 353, 374, 375, 376, 379, 381, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 408, 409, 410, 411, 412, 431, 432, 433, 434, 436, 437, 438, 439, 441, 442, 443, 444, 447, 448, 449, 451, 452, 453, 455, 456, 457, 460, 461, 462, 464, 465, 466, 467, 468, 471, 472, 473, 474, 477, 478, 479, 482, 483, 484, 487, 488, 489, 492, 493, 494, 498, 499, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 651, 652, 653, 654, 655, 656, 659, 660, 661, 663, 668, 669, 670, 677, 678, 679, 686, 687, 688, 691, 692, 695, 696, 697, 700, 701 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

In this table,the column **N.S.** in the table below, which stands for **normalized size** is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$. To help make the table fit, **Mathematica** was abbreviated to **MMA**.

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	87	130	189	101	151	195	-1
N.S.	1	1.00	0.68	1.02	1.48	0.79	1.18	1.52	-0.01
time (sec)	N/A	0.081	0.094	0.055	0.481	2.881	0.741	0.424	0.000

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	89	118	169	96	138	144	-1
N.S.	1	1.00	0.72	0.96	1.37	0.78	1.12	1.17	-0.01
time (sec)	N/A	0.067	0.074	0.026	0.491	2.244	0.528	0.399	0.000

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	85	110	148	91	126	142	-1
N.S.	1	1.00	0.81	1.05	1.41	0.87	1.20	1.35	-0.01
time (sec)	N/A	0.071	0.067	0.033	0.476	2.470	0.345	0.403	0.000

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	77	92	128	86	117	100	-1
N.S.	1	1.00	0.86	1.02	1.42	0.96	1.30	1.11	-0.01
time (sec)	N/A	0.027	0.063	0.055	0.485	2.458	0.258	0.432	0.000

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	88	82	97	71	90	80	-1
N.S.	1	1.00	1.14	1.06	1.26	0.92	1.17	1.04	-0.01
time (sec)	N/A	0.043	0.060	0.004	0.485	2.294	0.141	0.413	0.000

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	115	164	0	0	0	0	-1
N.S.	1	1.00	0.95	1.36	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.077	0.055	0.211	0.000	0.000	0.000	0.000	0.000

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	78	67	82	98	82	856	71
N.S.	1	1.00	1.13	0.97	1.19	1.42	1.19	12.41	1.03
time (sec)	N/A	0.055	0.024	0.007	0.481	2.132	2.647	1.225	0.233

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	112	186	0	0	0	0	-1
N.S.	1	1.00	0.81	1.34	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.090	0.047	0.290	0.000	0.000	0.000	0.000	0.000

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	93	91	123	109	177	296	-1
N.S.	1	1.00	1.15	1.12	1.52	1.35	2.19	3.65	-0.01
time (sec)	N/A	0.064	0.029	0.010	0.473	3.480	3.388	4.599	0.000

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	119	172	328	153	230	284	-1
N.S.	1	1.00	0.64	0.92	1.76	0.82	1.24	1.53	-0.01
time (sec)	N/A	0.143	0.073	0.075	0.485	3.787	1.506	0.427	0.000

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	115	160	298	149	218	205	-1
N.S.	1	1.00	0.62	0.87	1.62	0.81	1.18	1.11	-0.01
time (sec)	N/A	0.122	0.071	0.068	0.494	3.654	1.081	0.427	0.000

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	111	152	267	141	202	227	-1
N.S.	1	1.00	0.69	0.94	1.66	0.88	1.25	1.41	-0.01
time (sec)	N/A	0.117	0.061	0.079	0.486	3.122	0.894	0.417	0.000

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	94	127	237	137	190	157	-1
N.S.	1	1.00	0.76	1.02	1.91	1.10	1.53	1.27	-0.01
time (sec)	N/A	0.054	0.044	0.066	0.484	3.074	0.521	0.426	0.000

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	95	122	196	121	165	158	-1
N.S.	1	1.00	0.73	0.93	1.50	0.92	1.26	1.21	-0.01
time (sec)	N/A	0.072	0.064	0.066	0.508	3.222	0.455	0.437	0.000

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	166	224	0	0	0	0	-1
N.S.	1	1.00	0.90	1.22	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.143	0.208	0.214	0.000	0.000	0.000	0.000	0.000

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	126	117	160	152	182	2717	-1
N.S.	1	1.00	1.02	0.95	1.30	1.24	1.48	22.09	-0.01
time (sec)	N/A	0.113	0.061	0.068	0.501	2.813	3.606	6.287	0.000

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	201	201	185	264	0	0	0	0	-1
N.S.	1	1.00	0.92	1.31	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.141	0.118	0.410	0.000	0.000	0.000	0.000	0.000

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	136	115	170	162	233	1409	-1
N.S.	1	1.00	1.06	0.90	1.33	1.27	1.82	11.01	-0.01
time (sec)	N/A	0.114	0.062	0.068	0.490	2.975	4.380	58.264	0.000

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	143	214	479	189	289	353	-1
N.S.	1	1.00	0.62	0.92	2.06	0.81	1.25	1.52	-0.00
time (sec)	N/A	0.212	0.119	0.072	0.502	2.512	2.969	0.413	0.000

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	139	202	439	185	280	250	-1
N.S.	1	1.00	0.67	0.98	2.13	0.90	1.36	1.21	-0.00
time (sec)	N/A	0.122	0.117	0.073	0.501	2.304	2.232	0.427	0.000

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	135	194	398	177	265	296	-1
N.S.	1	1.00	0.65	0.94	1.92	0.86	1.28	1.43	-0.00
time (sec)	N/A	0.173	0.104	0.069	0.481	2.187	1.607	0.433	0.000

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	110	160	358	173	253	202	-1
N.S.	1	1.00	0.73	1.07	2.39	1.15	1.69	1.35	-0.01
time (sec)	N/A	0.053	0.058	0.066	0.485	3.308	1.221	0.422	0.000

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	119	164	307	157	221	224	-1
N.S.	1	1.00	0.68	0.94	1.75	0.90	1.26	1.28	-0.01
time (sec)	N/A	0.119	0.101	0.067	0.491	2.827	0.768	0.418	0.000

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	207	266	0	0	0	0	-1
N.S.	1	1.00	0.88	1.13	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.211	0.222	0.253	0.000	0.000	0.000	0.000	0.000

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	166	155	250	188	287	5513	-1
N.S.	1	1.00	1.01	0.95	1.52	1.15	1.75	33.62	-0.01
time (sec)	N/A	0.161	0.073	0.066	0.484	3.130	4.949	28.592	0.000

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	226	306	0	0	0	0	-1
N.S.	1	1.00	0.86	1.16	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.215	0.131	0.483	0.000	0.000	0.000	0.000	0.000

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	175	161	242	196	325	0	-1
N.S.	1	1.00	0.98	0.90	1.36	1.10	1.83	0.00	-0.01
time (sec)	N/A	0.184	0.101	0.063	0.479	3.135	5.630	0.000	0.000

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	286	249	0	0	0	0	-1
N.S.	1	1.00	1.66	1.45	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.168	0.218	0.204	0.000	0.000	0.000	0.000	0.000

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	312	165	0	0	0	0	-1
N.S.	1	1.00	2.17	1.15	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.129	0.076	0.199	0.000	0.000	0.000	0.000	0.000

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	238	197	0	0	0	0	-1
N.S.	1	1.00	1.92	1.59	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.095	0.066	0.086	0.000	0.000	0.000	0.000	0.000

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	244	107	0	0	0	0	-1
N.S.	1	1.00	2.98	1.30	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.073	0.042	0.074	0.000	0.000	0.000	0.000	0.000

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	207	156	0	0	0	0	-1
N.S.	1	1.00	2.46	1.86	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.046	0.117	0.152	0.000	0.000	0.000	0.000	0.000

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	105	164	0	0	0	0	-1
N.S.	1	1.00	1.48	2.31	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.078	0.053	0.118	0.000	0.000	0.000	0.000	0.000

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	259	236	0	0	0	0	-1
N.S.	1	1.00	2.23	2.03	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.110	0.242	0.175	0.000	0.000	0.000	0.000	0.000

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	149	278	0	0	0	0	-1
N.S.	1	1.00	1.20	2.24	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.133	0.227	0.243	0.000	0.000	0.000	0.000	0.000

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	173	350	291	0	0	0	0	-1
N.S.	1	1.00	2.02	1.68	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.174	0.092	0.211	0.000	0.000	0.000	0.000	0.000

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	187	187	332	273	0	0	0	0	-1
N.S.	1	1.00	1.78	1.46	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.168	0.284	0.339	0.000	0.000	0.000	0.000	0.000

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	334	226	0	0	0	0	-1
N.S.	1	1.00	2.15	1.46	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.132	0.306	0.316	0.000	0.000	0.000	0.000	0.000

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	463	238	0	0	0	0	-1
N.S.	1	1.00	3.22	1.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.093	0.111	0.188	0.000	0.000	0.000	0.000	0.000

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	50	98	136	55	0	89	-1
N.S.	1	1.00	0.88	1.72	2.39	0.96	0.00	1.56	-0.02
time (sec)	N/A	0.033	0.029	0.070	0.508	3.527	0.000	0.407	0.000

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	334	238	0	0	0	0	-1
N.S.	1	1.00	2.37	1.69	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.072	0.404	0.089	0.000	0.000	0.000	0.000	0.000

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	153	335	0	0	0	0	-1
N.S.	1	1.00	1.25	2.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.123	0.248	0.224	0.000	0.000	0.000	0.000	0.000

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	348	325	0	0	0	0	-1
N.S.	1	1.00	1.87	1.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.139	0.513	0.208	0.000	0.000	0.000	0.000	0.000

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	213	343	0	0	0	0	-1
N.S.	1	1.00	1.34	2.16	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.181	0.505	0.208	0.000	0.000	0.000	0.000	0.000

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	259	426	403	0	0	0	0	-1
N.S.	1	1.00	1.64	1.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.222	0.607	0.240	0.000	0.000	0.000	0.000	0.000

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	445	358	0	0	0	0	-1
N.S.	1	1.00	2.18	1.75	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.178	0.617	0.403	0.000	0.000	0.000	0.000	0.000

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	79	212	0	91	0	124	-1
N.S.	1	1.00	0.79	2.12	0.00	0.91	0.00	1.24	-0.01
time (sec)	N/A	0.061	0.047	0.070	0.000	2.020	0.000	0.436	0.000

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	445	358	0	0	0	0	-1
N.S.	1	1.00	2.20	1.77	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.123	0.463	0.296	0.000	0.000	0.000	0.000	0.000

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	62	151	0	88	0	172	-1
N.S.	1	1.00	0.75	1.82	0.00	1.06	0.00	2.07	-0.01
time (sec)	N/A	0.038	0.068	0.075	0.000	1.753	0.000	0.424	0.000

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	501	358	0	0	0	0	-1
N.S.	1	1.00	2.56	1.83	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.095	0.798	0.149	0.000	0.000	0.000	0.000	0.000

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	173	201	503	0	0	0	0	-1
N.S.	1	1.00	1.16	2.91	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.177	0.654	0.236	0.000	0.000	0.000	0.000	0.000

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	512	454	0	0	0	0	-1
N.S.	1	1.00	2.12	1.88	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.176	0.901	0.254	0.000	0.000	0.000	0.000	0.000

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	256	600	0	0	0	0	-1
N.S.	1	1.00	1.03	2.42	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.252	1.061	0.286	0.000	0.000	0.000	0.000	0.000

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	317	317	587	547	0	0	0	0	-1
N.S.	1	1.00	1.85	1.73	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.268	0.878	0.300	0.000	0.000	0.000	0.000	0.000

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	262	262	169	673	0	0	0	0	-1
N.S.	1	1.00	0.65	2.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.201	0.085	0.521	0.000	0.000	0.000	0.000	0.000

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	140	367	0	0	0	0	-1
N.S.	1	1.00	0.74	1.94	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.137	0.069	0.237	0.000	0.000	0.000	0.000	0.000

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	111	280	0	0	0	0	-1
N.S.	1	1.00	0.96	2.41	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.041	0.037	0.101	0.000	0.000	0.000	0.000	0.000

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	142	308	0	0	0	0	-1
N.S.	1	1.00	1.29	2.80	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.081	0.226	0.199	0.000	0.000	0.000	0.000	0.000

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	134	1117	137	414	0	0	-1
N.S.	1	1.00	1.21	10.06	1.23	3.73	0.00	0.00	-0.01
time (sec)	N/A	0.065	0.111	0.293	0.488	2.353	0.000	0.000	0.000

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	187	187	162	1903	140	501	0	0	-1
N.S.	1	1.00	0.87	10.18	0.75	2.68	0.00	0.00	-0.01
time (sec)	N/A	0.090	0.099	0.343	0.485	2.537	0.000	0.000	0.000

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	187	2751	199	567	0	0	-1
N.S.	1	1.00	0.71	10.46	0.76	2.16	0.00	0.00	-0.00
time (sec)	N/A	0.107	0.114	0.389	0.492	2.859	0.000	0.000	0.000

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	256	256	157	880	197	177	0	0	-1
N.S.	1	1.00	0.61	3.44	0.77	0.69	0.00	0.00	-0.00
time (sec)	N/A	0.122	0.111	0.353	0.500	2.078	0.000	0.000	0.000

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	134	544	138	150	0	0	-1
N.S.	1	1.00	0.73	2.97	0.75	0.82	0.00	0.00	-0.01
time (sec)	N/A	0.101	0.058	0.232	0.488	2.913	0.000	0.000	0.000

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	70	343	75	116	0	0	-1
N.S.	1	1.00	0.64	3.12	0.68	1.05	0.00	0.00	-0.01
time (sec)	N/A	0.044	0.055	0.128	0.497	2.825	0.000	0.000	0.000

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	187	413	0	0	0	0	-1
N.S.	1	1.00	0.92	2.03	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.136	0.340	0.149	0.000	0.000	0.000	0.000	0.000

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	239	462	0	0	0	0	-1
N.S.	1	1.00	1.06	2.05	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.145	1.440	0.215	0.000	0.000	0.000	0.000	0.000

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	301	301	321	571	0	0	0	0	-1
N.S.	1	1.00	1.07	1.90	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.196	2.880	0.281	0.000	0.000	0.000	0.000	0.000

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	193	770	0	0	0	0	-1
N.S.	1	1.00	0.57	2.26	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.282	0.119	0.467	0.000	0.000	0.000	0.000	0.000

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	265	265	170	682	0	0	0	0	-1
N.S.	1	1.00	0.64	2.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.211	0.106	0.266	0.000	0.000	0.000	0.000	0.000

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	210	480	0	0	0	0	-1
N.S.	1	1.00	1.12	2.55	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.076	0.350	0.102	0.000	0.000	0.000	0.000	0.000

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	222	464	0	0	0	0	-1
N.S.	1	1.00	1.20	2.51	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.118	0.368	0.220	0.000	0.000	0.000	0.000	0.000

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	211	1289	0	0	0	0	-1
N.S.	1	1.00	1.10	6.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.168	0.479	0.282	0.000	0.000	0.000	0.000	0.000

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	144	2350	172	525	0	0	-1
N.S.	1	1.00	0.94	15.26	1.12	3.41	0.00	0.00	-0.01
time (sec)	N/A	0.079	0.125	0.326	0.483	2.916	0.000	0.000	0.000

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	173	3384	151	599	0	0	-1
N.S.	1	1.00	0.75	14.65	0.65	2.59	0.00	0.00	-0.00
time (sec)	N/A	0.110	0.127	0.398	0.495	2.412	0.000	0.000	0.000

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	197	4563	210	671	0	0	-1
N.S.	1	1.00	0.64	14.81	0.68	2.18	0.00	0.00	-0.00
time (sec)	N/A	0.136	0.142	0.463	0.487	2.528	0.000	0.000	0.000

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	385	385	221	5886	269	743	0	0	-1
N.S.	1	1.00	0.57	15.29	0.70	1.93	0.00	0.00	-0.00
time (sec)	N/A	0.186	0.153	0.556	0.509	3.299	0.000	0.000	0.000

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	375	375	174	1781	267	249	0	0	-1
N.S.	1	1.00	0.46	4.75	0.71	0.66	0.00	0.00	-0.00
time (sec)	N/A	0.171	0.124	0.542	0.502	2.896	0.000	0.000	0.000

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	301	301	150	1254	208	219	0	0	-1
N.S.	1	1.00	0.50	4.17	0.69	0.73	0.00	0.00	-0.00
time (sec)	N/A	0.141	0.107	0.369	0.488	4.247	0.000	0.000	0.000

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	126	727	149	189	0	0	-1
N.S.	1	1.00	0.56	3.20	0.66	0.83	0.00	0.00	-0.00
time (sec)	N/A	0.118	0.091	0.202	0.486	4.094	0.000	0.000	0.000

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	103	524	87	159	0	0	-1
N.S.	1	1.00	0.67	3.42	0.57	1.04	0.00	0.00	-0.01
time (sec)	N/A	0.054	0.075	0.127	0.493	3.461	0.000	0.000	0.000

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	278	525	0	0	0	0	-1
N.S.	1	1.00	1.00	1.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.218	0.681	0.187	0.000	0.000	0.000	0.000	0.000

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	297	297	389	574	0	0	0	0	-1
N.S.	1	1.00	1.31	1.93	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.221	1.275	0.233	0.000	0.000	0.000	0.000	0.000

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	307	307	494	601	0	0	0	0	-1
N.S.	1	1.00	1.61	1.96	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.232	3.765	0.280	0.000	0.000	0.000	0.000	0.000

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	430	430	220	1106	0	0	0	0	-1
N.S.	1	1.00	0.51	2.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.382	0.156	0.510	0.000	0.000	0.000	0.000	0.000

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	351	351	196	907	0	0	0	0	-1
N.S.	1	1.00	0.56	2.58	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.316	0.128	0.283	0.000	0.000	0.000	0.000	0.000

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	265	265	266	691	0	0	0	0	-1
N.S.	1	1.00	1.00	2.61	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.110	0.568	0.141	0.000	0.000	0.000	0.000	0.000

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	257	1391	0	0	0	0	-1
N.S.	1	1.00	0.96	5.19	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.172	0.590	0.250	0.000	0.000	0.000	0.000	0.000

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	243	1527	0	0	0	0	-1
N.S.	1	1.00	0.88	5.51	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.207	0.933	0.325	0.000	0.000	0.000	0.000	0.000

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	234	2615	0	0	0	0	-1
N.S.	1	1.00	0.84	9.44	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.246	0.858	0.345	0.000	0.000	0.000	0.000	0.000

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	156	4031	205	655	0	0	-1
N.S.	1	1.00	0.77	19.86	1.01	3.23	0.00	0.00	-0.00
time (sec)	N/A	0.087	0.144	0.397	0.511	3.898	0.000	0.000	0.000

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	184	5324	162	747	0	0	-1
N.S.	1	1.00	0.65	18.88	0.57	2.65	0.00	0.00	-0.00
time (sec)	N/A	0.118	0.152	0.466	0.498	2.895	0.000	0.000	0.000

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	209	6761	221	831	0	0	-1
N.S.	1	1.00	0.58	18.73	0.61	2.30	0.00	0.00	-0.00
time (sec)	N/A	0.145	0.161	0.620	0.508	2.576	0.000	0.000	0.000

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	354	354	160	1644	219	291	0	0	-1
N.S.	1	1.00	0.45	4.64	0.62	0.82	0.00	0.00	-0.00
time (sec)	N/A	0.161	0.127	0.424	0.495	2.154	0.000	0.000	0.000

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	137	1063	160	255	0	0	-1
N.S.	1	1.00	0.49	3.82	0.58	0.92	0.00	0.00	-0.00
time (sec)	N/A	0.125	0.111	0.283	0.496	1.678	0.000	0.000	0.000

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	113	717	98	215	0	0	-1
N.S.	1	1.00	0.56	3.55	0.49	1.06	0.00	0.00	-0.00
time (sec)	N/A	0.062	0.085	0.149	0.489	1.902	0.000	0.000	0.000

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	394	652	0	0	0	0	-1
N.S.	1	1.00	1.09	1.81	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.310	1.103	0.207	0.000	0.000	0.000	0.000	0.000

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	386	386	484	704	0	0	0	0	-1
N.S.	1	1.00	1.25	1.82	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.305	3.024	0.256	0.000	0.000	0.000	0.000	0.000

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	389	389	640	727	0	0	0	0	-1
N.S.	1	1.00	1.65	1.87	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.308	4.009	0.299	0.000	0.000	0.000	0.000	0.000

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	30	31	30	26	39	27	-1
N.S.	1	1.00	0.88	0.91	0.88	0.76	1.15	0.79	-0.03
time (sec)	N/A	0.021	0.006	0.125	0.483	1.764	1.060	0.389	0.000

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	87	97	0	0	0	0	-1
N.S.	1	1.00	1.28	1.43	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.039	0.019	0.076	0.000	0.000	0.000	0.000	0.000

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	64	76	85	60	82	91	-1
N.S.	1	1.00	0.73	0.86	0.97	0.68	0.93	1.03	-0.01
time (sec)	N/A	0.099	0.021	0.141	0.489	1.650	0.477	0.429	0.000

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	49	95	61	44	65	0	-1
N.S.	1	1.00	0.68	1.32	0.85	0.61	0.90	0.00	-0.01
time (sec)	N/A	0.077	0.018	0.070	0.480	2.121	0.352	0.000	0.000

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	43	40	56	39	42	53	-1
N.S.	1	1.00	0.86	0.80	1.12	0.78	0.84	1.06	-0.02
time (sec)	N/A	0.056	0.009	0.076	0.482	1.682	0.284	0.407	0.000

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	62	27	26	24	27	-1
N.S.	1	1.00	1.00	2.14	0.93	0.90	0.83	0.93	-0.03
time (sec)	N/A	0.028	0.007	0.078	0.485	2.243	0.213	0.403	0.000

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	10	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.77	0.85	0.85
time (sec)	N/A	0.013	0.004	0.072	0.474	1.675	0.198	0.403	0.138

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	71	103	0	0	0	0	-1
N.S.	1	1.00	1.37	1.98	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.061	0.059	0.075	0.000	0.000	0.000	0.000	0.000

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	32	26	28	0	67	-1
N.S.	1	1.00	1.00	1.14	0.93	1.00	0.00	2.39	-0.04
time (sec)	N/A	0.044	0.017	0.074	0.480	1.913	0.000	0.399	0.000

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	137	171	0	0	0	0	-1
N.S.	1	1.00	1.40	1.74	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.108	0.565	0.393	0.000	0.000	0.000	0.000	0.000

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	119	521	180	150	0	0	-1
N.S.	1	1.00	0.53	2.33	0.80	0.67	0.00	0.00	-0.00
time (sec)	N/A	0.193	0.051	0.355	0.496	1.693	0.000	0.000	0.000

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	161	377	0	0	0	0	-1
N.S.	1	1.00	0.80	1.88	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.164	0.568	0.358	0.000	0.000	0.000	0.000	0.000

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	92	407	121	120	0	0	-1
N.S.	1	1.00	0.62	2.75	0.82	0.81	0.00	0.00	-0.01
time (sec)	N/A	0.113	0.034	0.263	0.488	1.700	0.000	0.000	0.000

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	134	268	0	0	0	0	-1
N.S.	1	1.00	1.08	2.16	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.092	0.736	0.164	0.000	0.000	0.000	0.000	0.000

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	64	159	58	92	0	0	-1
N.S.	1	1.00	0.96	2.37	0.87	1.37	0.00	0.00	-0.01
time (sec)	N/A	0.046	0.020	0.114	0.482	2.399	0.000	0.000	0.000

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	50	86	28	0	0	0	-1
N.S.	1	1.00	1.02	1.76	0.57	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.021	0.021	0.074	0.484	0.000	0.000	0.000	0.000

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	146	180	0	0	0	0	-1
N.S.	1	1.00	1.01	1.24	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.095	0.203	0.119	0.000	0.000	0.000	0.000	0.000

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	69	216	104	218	0	0	-1
N.S.	1	1.00	1.05	3.27	1.58	3.30	0.00	0.00	-0.02
time (sec)	N/A	0.067	0.089	0.207	0.495	5.127	0.000	0.000	0.000

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	244	461	0	0	0	0	-1
N.S.	1	1.00	1.07	2.01	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.170	1.587	0.223	0.000	0.000	0.000	0.000	0.000

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	152	850	124	433	0	0	-1
N.S.	1	1.00	1.03	5.78	0.84	2.95	0.00	0.00	-0.01
time (sec)	N/A	0.135	0.139	0.369	0.490	4.807	0.000	0.000	0.000

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	166	425	0	441	0	0	-1
N.S.	1	1.00	0.75	1.92	0.00	2.00	0.00	0.00	-0.00
time (sec)	N/A	0.141	0.191	0.359	0.000	2.613	0.000	0.000	0.000

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	173	432	0	0	0	0	-1
N.S.	1	1.00	0.81	2.02	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.190	0.300	0.365	0.000	0.000	0.000	0.000	0.000

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	136	307	142	382	0	0	-1
N.S.	1	1.00	0.96	2.16	1.00	2.69	0.00	0.00	-0.01
time (sec)	N/A	0.110	0.140	0.251	0.490	3.073	0.000	0.000	0.000

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	160	274	0	0	0	0	-1
N.S.	1	1.00	1.19	2.03	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.098	0.130	0.165	0.000	0.000	0.000	0.000	0.000

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	51	194	0	279	0	0	-1
N.S.	1	1.00	0.70	2.66	0.00	3.82	0.00	0.00	-0.01
time (sec)	N/A	0.049	0.016	0.095	0.000	2.142	0.000	0.000	0.000

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	77	177	62	0	0	0	-1
N.S.	1	1.00	0.96	2.21	0.78	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.026	0.113	0.085	0.488	0.000	0.000	0.000	0.000

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	300	344	0	0	0	0	-1
N.S.	1	1.00	1.36	1.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.167	0.650	0.148	0.000	0.000	0.000	0.000	0.000

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	117	240	129	0	0	0	-1
N.S.	1	1.00	0.78	1.60	0.86	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.107	0.154	0.203	0.505	0.000	0.000	0.000	0.000

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	316	316	404	474	0	0	0	0	-1
N.S.	1	1.00	1.28	1.50	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.263	1.404	0.233	0.000	0.000	0.000	0.000	0.000

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	238	238	162	1048	0	0	0	0	-1
N.S.	1	1.00	0.68	4.40	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.137	0.200	0.391	0.000	0.000	0.000	0.000	0.000

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	253	2245	0	0	0	0	-1
N.S.	1	1.00	0.86	7.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.296	0.416	0.386	0.000	0.000	0.000	0.000	0.000

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	169	464	0	481	0	0	-1
N.S.	1	1.00	0.77	2.12	0.00	2.20	0.00	0.00	-0.00
time (sec)	N/A	0.143	0.196	0.354	0.000	2.976	0.000	0.000	0.000

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	213	531	0	0	0	0	-1
N.S.	1	1.00	1.00	2.50	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.196	0.290	0.375	0.000	0.000	0.000	0.000	0.000

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	143	308	160	421	0	0	-1
N.S.	1	1.00	0.95	2.05	1.07	2.81	0.00	0.00	-0.01
time (sec)	N/A	0.124	0.153	0.254	0.490	3.519	0.000	0.000	0.000

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	103	1242	153	0	0	0	-1
N.S.	1	1.00	0.82	9.94	1.22	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.094	0.118	0.195	0.487	0.000	0.000	0.000	0.000

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	85	259	0	374	0	0	-1
N.S.	1	1.00	0.71	2.18	0.00	3.14	0.00	0.00	-0.01
time (sec)	N/A	0.057	0.029	0.128	0.000	3.334	0.000	0.000	0.000

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	113	1072	141	0	0	0	-1
N.S.	1	1.00	0.73	6.96	0.92	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.059	0.132	0.131	0.500	0.000	0.000	0.000	0.000

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	456	449	0	0	0	0	-1
N.S.	1	1.00	1.57	1.54	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.276	1.158	0.161	0.000	0.000	0.000	0.000	0.000

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	188	1346	0	0	0	0	-1
N.S.	1	1.00	0.84	6.01	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.138	0.191	0.250	0.000	0.000	0.000	0.000	0.000

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	433	433	537	624	0	0	0	0	-1
N.S.	1	1.00	1.24	1.44	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.372	7.104	0.280	0.000	0.000	0.000	0.000	0.000

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	213	1877	255	0	0	0	-1
N.S.	1	1.00	0.69	6.05	0.82	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.185	0.208	0.394	0.516	0.000	0.000	0.000	0.000

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	111	409	149	0	0	128	-1
N.S.	1	1.00	0.53	1.95	0.71	0.00	0.00	0.61	-0.00
time (sec)	N/A	0.085	0.136	0.249	0.506	0.000	0.000	0.459	0.000

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	68	0	0	0	0	0	-1
N.S.	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.072	0.031	0.098	0.000	0.000	0.000	0.000	0.000

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	97	0	0	0	0	0	-1
N.S.	1	1.00	0.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.089	0.028	0.504	0.000	0.000	0.000	0.000	0.000

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	315	315	256	0	0	0	0	0	-1
N.S.	1	1.00	0.81	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.337	0.337	4.641	0.000	0.000	0.000	0.000	0.000

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	187	0	0	0	0	0	-1
N.S.	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.218	0.012	2.758	0.000	0.000	0.000	0.000	0.000

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	118	0	0	0	0	0	-1
N.S.	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.113	0.036	2.475	0.000	0.000	0.000	0.000	0.000

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.043	2.848	0.790	0.000	0.000	0.000	0.000	0.000

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	117	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.107	4.065	0.802	0.000	0.000	0.000	0.000	0.000

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	208	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.172	4.343	0.440	0.000	0.000	0.000	0.000	0.000

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	635	635	338	0	0	0	0	0	-1
N.S.	1	1.00	0.53	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.377	0.833	3.981	0.000	0.000	0.000	0.000	0.000

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	399	399	237	0	0	0	0	0	-1
N.S.	1	1.00	0.59	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.222	0.376	2.161	0.000	0.000	0.000	0.000	0.000

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	181	0	0	0	0	0	-1
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.129	0.051	1.949	0.000	0.000	0.000	0.000	0.000

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	129	0	0	0	0	0	-1
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.073	0.046	0.608	0.000	0.000	0.000	0.000	0.000

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	272	272	207	0	0	0	0	0	-1
N.S.	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.164	0.165	0.823	0.000	0.000	0.000	0.000	0.000

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	408	408	279	0	0	0	0	0	-1
N.S.	1	1.00	0.68	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.255	0.247	0.352	0.000	0.000	0.000	0.000	0.000

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	95	0	0	0	0	0	-1
N.S.	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.047	0.024	0.442	0.000	0.000	0.000	0.000	0.000

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	290	290	203	276	453	229	388	495	-1
N.S.	1	1.00	0.70	0.95	1.56	0.79	1.34	1.71	-0.00
time (sec)	N/A	0.307	0.179	0.176	0.497	1.681	1.199	0.443	0.000

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	192	320	0	211	332	377	-1
N.S.	1	1.00	0.95	1.58	0.00	1.04	1.64	1.87	-0.00
time (sec)	N/A	0.376	0.108	0.063	0.000	2.280	0.844	0.440	0.000

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	179	280	354	194	313	356	-1
N.S.	1	1.00	0.85	1.33	1.68	0.92	1.48	1.69	-0.00
time (sec)	N/A	0.243	0.153	0.129	0.502	3.064	0.605	0.440	0.000

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	157	192	0	176	269	248	-1
N.S.	1	1.00	1.14	1.39	0.00	1.28	1.95	1.80	-0.01
time (sec)	N/A	0.095	0.174	0.118	0.000	2.764	0.412	0.448	0.000

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	137	173	233	146	224	196	-1
N.S.	1	1.00	1.07	1.35	1.82	1.14	1.75	1.53	-0.01
time (sec)	N/A	0.100	0.148	0.038	0.493	3.993	0.311	0.449	0.000

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	256	421	0	0	0	0	-1
N.S.	1	1.00	1.44	2.37	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.171	0.303	0.277	0.000	0.000	0.000	0.000	0.000

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	203	250	0	0	0	0	-1
N.S.	1	1.00	1.36	1.68	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.203	0.311	0.313	0.000	0.000	0.000	0.000	0.000

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	236	527	0	0	0	0	-1
N.S.	1	1.00	1.22	2.73	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.204	0.259	0.473	0.000	0.000	0.000	0.000	0.000

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	266	287	0	0	0	0	-1
N.S.	1	1.00	1.51	1.63	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.268	0.526	0.566	0.000	0.000	0.000	0.000	0.000

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	395	395	253	531	781	337	563	702	-1
N.S.	1	1.00	0.64	1.34	1.98	0.85	1.43	1.78	-0.00
time (sec)	N/A	0.498	0.153	0.199	0.535	2.114	2.239	0.453	0.000

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	302	302	239	424	0	319	515	522	-1
N.S.	1	1.00	0.79	1.40	0.00	1.06	1.71	1.73	-0.00
time (sec)	N/A	0.689	0.154	0.181	0.000	2.339	1.747	0.444	0.000

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	229	400	634	296	483	553	-1
N.S.	1	1.00	0.74	1.29	2.05	0.95	1.56	1.78	-0.00
time (sec)	N/A	0.400	0.137	0.091	0.527	2.511	1.184	0.459	0.000

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	209	270	0	278	430	383	-1
N.S.	1	1.00	1.00	1.29	0.00	1.33	2.06	1.83	-0.00
time (sec)	N/A	0.140	0.163	0.083	0.000	2.901	0.894	0.447	0.000

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	193	275	465	247	389	374	-1
N.S.	1	1.00	0.88	1.26	2.12	1.13	1.78	1.71	-0.00
time (sec)	N/A	0.181	0.167	0.072	0.535	2.819	0.576	0.453	0.000

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	271	271	371	560	0	0	0	0	-1
N.S.	1	1.00	1.37	2.07	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.296	0.279	0.328	0.000	0.000	0.000	0.000	0.000

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	249	249	322	372	0	0	0	0	-1
N.S.	1	1.00	1.29	1.49	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.339	0.635	0.328	0.000	0.000	0.000	0.000	0.000

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	361	717	0	0	0	0	-1
N.S.	1	1.00	1.26	2.50	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.332	0.572	0.631	0.000	0.000	0.000	0.000	0.000

Problem 173	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	374	378	0	0	0	0	-1
N.S.	1	1.00	1.40	1.41	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.450	0.578	0.602	0.000	0.000	0.000	0.000	0.000

Problem 174	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	476	476	301	672	1141	413	702	865	-1
N.S.	1	1.00	0.63	1.41	2.40	0.87	1.47	1.82	-0.00
time (sec)	N/A	0.702	0.273	0.169	0.546	3.070	4.161	0.459	0.000

Problem 175	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	384	384	287	519	0	395	654	631	-1
N.S.	1	1.00	0.75	1.35	0.00	1.03	1.70	1.64	-0.00
time (sec)	N/A	1.096	0.290	0.154	0.000	2.041	3.294	0.452	0.000

Problem 176	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	391	391	277	525	946	372	626	716	-1
N.S.	1	1.00	0.71	1.34	2.42	0.95	1.60	1.83	-0.00
time (sec)	N/A	0.571	0.251	0.092	0.522	1.387	2.251	0.450	0.000

Problem 177	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	257	336	0	354	573	492	-1
N.S.	1	1.00	0.96	1.25	0.00	1.32	2.14	1.84	-0.00
time (sec)	N/A	0.171	0.200	0.076	0.000	4.843	1.772	0.452	0.000

Problem 178	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	298	298	241	384	729	323	524	528	-1
N.S.	1	1.00	0.81	1.29	2.45	1.08	1.76	1.77	-0.00
time (sec)	N/A	0.260	0.247	0.083	0.495	7.139	1.203	0.433	0.000

Problem 179	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	354	354	466	661	0	0	0	0	-1
N.S.	1	1.00	1.32	1.87	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.458	0.474	0.464	0.000	0.000	0.000	0.000	0.000

Problem 180	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	483	464	0	0	0	0	-1
N.S.	1	1.00	1.47	1.41	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.478	0.828	0.466	0.000	0.000	0.000	0.000	0.000

Problem 181	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	371	371	556	819	0	0	0	0	-1
N.S.	1	1.00	1.50	2.21	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.486	0.407	0.728	0.000	0.000	0.000	0.000	0.000

Problem 182	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	348	348	480	488	0	0	0	0	-1
N.S.	1	1.00	1.38	1.40	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.661	0.715	0.654	0.000	0.000	0.000	0.000	0.000

Problem 183	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	297	297	508	0	0	0	0	0	-1
N.S.	1	1.00	1.71	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.378	0.527	0.007	0.000	0.000	0.000	0.000	0.000

Problem 184	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	459	380	0	0	0	0	-1
N.S.	1	1.00	2.19	1.81	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.268	0.251	0.348	0.000	0.000	0.000	0.000	0.000

Problem 185	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	218	218	317	0	0	0	0	0	-1
N.S.	1	1.00	1.45	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.201	0.199	0.003	0.000	0.000	0.000	0.000	0.000

Problem 186	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	143	235	0	0	0	0	-1
N.S.	1	1.00	1.22	2.01	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.126	0.057	0.076	0.000	0.000	0.000	0.000	0.000

Problem 187	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	207	375	0	0	0	0	-1
N.S.	1	1.00	1.33	2.40	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.087	0.258	0.165	0.000	0.000	0.000	0.000	0.000

Problem 188	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	254	475	0	0	0	0	-1
N.S.	1	1.00	1.94	3.63	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.142	0.129	0.149	0.000	0.000	0.000	0.000	0.000

Problem 189	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	238	238	391	569	0	0	0	0	-1
N.S.	1	1.00	1.64	2.39	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.244	0.445	0.267	0.000	0.000	0.000	0.000	0.000

Problem 190	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	353	741	0	0	0	0	-1
N.S.	1	1.00	1.68	3.53	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.270	0.789	0.431	0.000	0.000	0.000	0.000	0.000

Problem 191	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	849	691	0	0	0	0	-1
N.S.	1	1.00	2.55	2.08	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.449	7.160	0.359	0.000	0.000	0.000	0.000	0.000

Problem 192	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	300	300	971	640	0	0	0	0	-1
N.S.	1	1.00	3.24	2.13	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.369	5.023	0.498	0.000	0.000	0.000	0.000	0.000

Problem 193	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	502	534	0	0	0	0	-1
N.S.	1	1.00	2.21	2.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.276	0.715	0.486	0.000	0.000	0.000	0.000	0.000

Problem 194	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	727	548	0	0	0	0	-1
N.S.	1	1.00	3.12	2.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.205	3.770	0.316	0.000	0.000	0.000	0.000	0.000

Problem 195	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	75	182	293	102	0	204	-1
N.S.	1	1.00	0.84	2.04	3.29	1.15	0.00	2.29	-0.01
time (sec)	N/A	0.077	0.122	0.079	0.506	2.669	0.000	0.473	0.000

Problem 196	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	359	548	0	0	0	0	-1
N.S.	1	1.00	1.56	2.38	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.164	1.442	0.158	0.000	0.000	0.000	0.000	0.000

Problem 197	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	365	829	0	0	0	0	-1
N.S.	1	1.00	1.73	3.93	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.222	0.881	0.362	0.000	0.000	0.000	0.000	0.000

Problem 198	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	324	324	1059	763	0	0	0	0	-1
N.S.	1	1.00	3.27	2.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.381	8.434	0.320	0.000	0.000	0.000	0.000	0.000

Problem 199	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	430	845	0	0	0	0	-1
N.S.	1	1.00	1.59	3.13	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.383	1.103	0.285	0.000	0.000	0.000	0.000	0.000

Problem 200	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	439	439	1390	964	0	0	0	0	-1
N.S.	1	1.00	3.17	2.20	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.651	10.822	0.397	0.000	0.000	0.000	0.000	0.000

Problem 201	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	343	343	1012	844	0	0	0	0	-1
N.S.	1	1.00	2.95	2.46	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.382	5.971	0.618	0.000	0.000	0.000	0.000	0.000

Problem 202	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	192	377	0	198	0	318	-1
N.S.	1	1.00	1.12	2.19	0.00	1.15	0.00	1.85	-0.01
time (sec)	N/A	0.237	0.132	0.487	0.000	3.318	0.000	0.495	0.000

Problem 203	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	341	341	791	844	0	0	0	0	-1
N.S.	1	1.00	2.32	2.48	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.298	4.670	0.477	0.000	0.000	0.000	0.000	0.000

Problem 204	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	162	291	0	165	0	395	-1
N.S.	1	1.00	1.08	1.94	0.00	1.10	0.00	2.63	-0.01
time (sec)	N/A	0.099	0.117	0.088	0.000	3.143	0.000	0.476	0.000

Problem 205	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	556	844	0	0	0	0	-1
N.S.	1	1.00	1.67	2.54	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.248	3.278	0.219	0.000	0.000	0.000	0.000	0.000

Problem 206	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	296	296	459	1224	0	0	0	0	-1
N.S.	1	1.00	1.55	4.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.357	2.363	0.384	0.000	0.000	0.000	0.000	0.000

Problem 207	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	429	429	1351	1074	0	0	0	0	-1
N.S.	1	1.00	3.15	2.50	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.532	9.965	0.420	0.000	0.000	0.000	0.000	0.000

Problem 208	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	403	403	569	1467	0	0	0	0	-1
N.S.	1	1.00	1.41	3.64	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.548	4.405	0.444	0.000	0.000	0.000	0.000	0.000

Problem 209	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	572	572	1657	1291	0	0	0	0	-1
N.S.	1	1.00	2.90	2.26	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.876	10.180	0.507	0.000	0.000	0.000	0.000	0.000

Problem 210	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	374	374	242	1165	311	277	0	0	-1
N.S.	1	1.00	0.65	3.11	0.83	0.74	0.00	0.00	-0.00
time (sec)	N/A	0.340	0.186	0.401	0.493	3.387	0.000	0.000	0.000

Problem 211	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	303	303	246	678	0	0	0	0	-1
N.S.	1	1.00	0.81	2.24	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.259	0.223	0.438	0.000	0.000	0.000	0.000	0.000

Problem 212	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	120	700	188	208	0	0	-1
N.S.	1	1.00	0.64	3.72	1.00	1.11	0.00	0.00	-0.01
time (sec)	N/A	0.121	0.182	0.207	0.524	3.409	0.000	0.000	0.000

Problem 213	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	128	531	0	0	0	0	-1
N.S.	1	1.00	0.67	2.77	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.085	0.144	0.141	0.000	0.000	0.000	0.000	0.000

Problem 214	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	378	378	391	1017	0	0	0	0	-1
N.S.	1	1.00	1.03	2.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.240	0.753	0.264	0.000	0.000	0.000	0.000	0.000

Problem 215	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	257	762	0	0	0	0	-1
N.S.	1	1.00	1.13	3.36	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.179	0.672	0.322	0.000	0.000	0.000	0.000	0.000

Problem 216	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	398	398	480	1082	0	0	0	0	-1
N.S.	1	1.00	1.21	2.72	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.256	3.172	0.354	0.000	0.000	0.000	0.000	0.000

Problem 217	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	314	314	248	3017	0	0	0	0	-1
N.S.	1	1.00	0.79	9.61	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.195	0.837	0.451	0.000	0.000	0.000	0.000	0.000

Problem 218	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	503	503	244	1678	356	360	0	0	-1
N.S.	1	1.00	0.49	3.34	0.71	0.72	0.00	0.00	-0.00
time (sec)	N/A	0.559	0.198	0.428	0.526	1.921	0.000	0.000	0.000

Problem 219	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	421	421	297	1320	0	0	0	0	-1
N.S.	1	1.00	0.71	3.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.445	0.200	0.502	0.000	0.000	0.000	0.000	0.000

Problem 220	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	200	1151	236	295	0	0	-1
N.S.	1	1.00	0.72	4.13	0.85	1.06	0.00	0.00	-0.00
time (sec)	N/A	0.156	0.184	0.266	0.522	2.079	0.000	0.000	0.000

Problem 221	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	305	307	329	929	0	0	0	0	-1
N.S.	1	1.01	1.08	3.05	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.170	0.710	0.183	0.000	0.000	0.000	0.000	0.000

Problem 222	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	545	545	576	1276	0	0	0	0	-1
N.S.	1	1.00	1.06	2.34	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.404	1.604	0.303	0.000	0.000	0.000	0.000	0.000

Problem 223	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	424	424	396	1148	0	0	0	0	-1
N.S.	1	1.00	0.93	2.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.284	1.629	0.372	0.000	0.000	0.000	0.000	0.000

Problem 224	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	590	590	813	1372	0	0	0	0	-1
N.S.	1	1.00	1.38	2.33	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.435	6.764	0.415	0.000	0.000	0.000	0.000	0.000

Problem 225	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	400	400	493	3281	0	0	0	0	-1
N.S.	1	1.00	1.23	8.20	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.394	1.248	0.457	0.000	0.000	0.000	0.000	0.000

Problem 226	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	651	651	270	2146	401	486	0	0	-1
N.S.	1	1.00	0.41	3.30	0.62	0.75	0.00	0.00	-0.00
time (sec)	N/A	0.823	0.255	0.441	0.509	2.230	0.000	0.000	0.000

Problem 227	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	556	556	348	1939	0	0	0	0	-1
N.S.	1	1.00	0.63	3.49	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.705	0.266	0.576	0.000	0.000	0.000	0.000	0.000

Problem 228	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	382	382	226	1611	281	405	0	0	-1
N.S.	1	1.00	0.59	4.22	0.74	1.06	0.00	0.00	-0.00
time (sec)	N/A	0.204	0.205	0.325	0.513	1.819	0.000	0.000	0.000

Problem 229	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	438	438	407	1349	0	0	0	0	-1
N.S.	1	1.00	0.93	3.08	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.272	1.188	0.221	0.000	0.000	0.000	0.000	0.000

Problem 230	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	687	687	775	1574	0	0	0	0	-1
N.S.	1	1.00	1.13	2.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.617	2.744	0.358	0.000	0.000	0.000	0.000	0.000

Problem 231	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	561	561	586	3585	0	0	0	0	-1
N.S.	1	1.00	1.04	6.39	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.422	1.403	0.418	0.000	0.000	0.000	0.000	0.000

Problem 232	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	740	740	1073	1674	0	0	0	0	-1
N.S.	1	1.00	1.45	2.26	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.657	6.896	0.439	0.000	0.000	0.000	0.000	0.000

Problem 233	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	591	591	690	3855	0	0	0	0	-1
N.S.	1	1.00	1.17	6.52	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.563	2.415	0.502	0.000	0.000	0.000	0.000	0.000

Problem 234	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	400	400	230	1020	365	276	0	0	-1
N.S.	1	1.00	0.58	2.55	0.91	0.69	0.00	0.00	-0.00
time (sec)	N/A	0.387	0.119	0.596	0.497	2.271	0.000	0.000	0.000

Problem 235	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	337	337	283	722	0	0	0	0	-1
N.S.	1	1.00	0.84	2.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.301	0.916	0.599	0.000	0.000	0.000	0.000	0.000

Problem 236	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	176	812	251	210	0	0	-1
N.S.	1	1.00	0.64	2.93	0.91	0.76	0.00	0.00	-0.00
time (sec)	N/A	0.214	0.078	0.426	0.504	2.556	0.000	0.000	0.000

Problem 237	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	213	210	517	0	0	0	0	-1
N.S.	1	1.03	1.02	2.51	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.154	0.781	0.266	0.000	0.000	0.000	0.000	0.000

Problem 238	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	86	316	130	147	0	0	-1
N.S.	1	1.00	0.59	2.16	0.89	1.01	0.00	0.00	-0.01
time (sec)	N/A	0.085	0.059	0.146	0.509	2.407	0.000	0.000	0.000

Problem 239	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	64	143	47	0	0	0	-1
N.S.	1	1.00	1.31	2.92	0.96	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.037	0.048	0.082	0.499	0.000	0.000	0.000	0.000

Problem 240	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	301	387	0	0	0	0	-1
N.S.	1	1.00	1.17	1.51	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.158	0.404	0.190	0.000	0.000	0.000	0.000	0.000

Problem 241	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	159	638	0	0	0	0	-1
N.S.	1	1.00	0.87	3.49	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.158	0.300	0.309	0.000	0.000	0.000	0.000	0.000

Problem 242	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	402	402	487	1107	0	0	0	0	-1
N.S.	1	1.00	1.21	2.75	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.292	3.727	0.330	0.000	0.000	0.000	0.000	0.000

Problem 243	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	319	319	269	2319	0	0	0	0	-1
N.S.	1	1.00	0.84	7.27	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.278	0.512	0.559	0.000	0.000	0.000	0.000	0.000

Problem 244	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	549	549	453	1087	0	0	0	0	-1
N.S.	1	1.00	0.83	1.98	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.516	0.470	0.615	0.000	0.000	0.000	0.000	0.000

Problem 245	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	424	424	312	973	0	0	0	0	-1
N.S.	1	1.00	0.74	2.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.426	1.458	0.589	0.000	0.000	0.000	0.000	0.000

Problem 246	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	412	412	369	829	0	0	0	0	-1
N.S.	1	1.00	0.90	2.01	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.320	0.360	0.403	0.000	0.000	0.000	0.000	0.000

Problem 247	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	295	581	0	0	0	0	-1
N.S.	1	1.00	1.18	2.32	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.229	0.373	0.263	0.000	0.000	0.000	0.000	0.000

Problem 248	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	276	540	0	0	0	0	-1
N.S.	1	1.00	1.33	2.60	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.126	0.317	0.151	0.000	0.000	0.000	0.000	0.000

Problem 249	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	195	165	425	0	0	0	0	-1
N.S.	1	1.00	0.85	2.18	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.121	0.262	0.121	0.000	0.000	0.000	0.000	0.000

Problem 250	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	467	467	667	1096	0	0	0	0	-1
N.S.	1	1.00	1.43	2.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.338	1.106	0.284	0.000	0.000	0.000	0.000	0.000

Problem 251	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	322	806	0	0	0	0	-1
N.S.	1	1.00	0.97	2.42	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.316	0.498	0.332	0.000	0.000	0.000	0.000	0.000

Problem 252	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	634	634	844	1490	0	0	0	0	-1
N.S.	1	1.00	1.33	2.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.572	7.514	0.421	0.000	0.000	0.000	0.000	0.000

Problem 253	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	483	483	462	2844	0	0	0	0	-1
N.S.	1	1.00	0.96	5.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.579	0.584	0.578	0.000	0.000	0.000	0.000	0.000

Problem 254	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	546	546	594	1202	0	0	0	0	-1
N.S.	1	1.00	1.09	2.20	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.613	1.002	0.606	0.000	0.000	0.000	0.000	0.000

Problem 255	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	421	421	374	1304	0	0	0	0	-1
N.S.	1	1.00	0.89	3.10	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.518	0.990	0.648	0.000	0.000	0.000	0.000	0.000

Problem 256	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	511	828	0	0	0	0	-1
N.S.	1	1.00	1.54	2.49	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.372	0.532	0.414	0.000	0.000	0.000	0.000	0.000

Problem 257	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	303	3298	0	0	0	0	-1
N.S.	1	1.00	0.91	9.93	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.264	0.511	0.322	0.000	0.000	0.000	0.000	0.000

Problem 258	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	294	294	461	762	0	0	0	0	-1
N.S.	1	1.00	1.57	2.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.156	0.613	0.204	0.000	0.000	0.000	0.000	0.000

Problem 259	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	311	311	320	2895	0	0	0	0	-1
N.S.	1	1.00	1.03	9.31	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.201	0.585	0.171	0.000	0.000	0.000	0.000	0.000

Problem 260	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	577	577	935	1373	0	0	0	0	-1
N.S.	1	1.00	1.62	2.38	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.522	7.584	0.329	0.000	0.000	0.000	0.000	0.000

Problem 261	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	452	452	352	3773	0	0	0	0	-1
N.S.	1	1.00	0.78	8.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.430	1.797	0.394	0.000	0.000	0.000	0.000	0.000

Problem 262	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	752	752	1090	1876	0	0	0	0	-1
N.S.	1	1.00	1.45	2.49	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.794	9.128	0.461	0.000	0.000	0.000	0.000	0.000

Problem 263	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	538	538	441	5225	0	0	0	0	-1
N.S.	1	1.00	0.82	9.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.723	2.486	0.609	0.000	0.000	0.000	0.000	0.000

Problem 264	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	100	129	0	84	146	143	-1
N.S.	1	1.00	0.64	0.82	0.00	0.54	0.93	0.91	-0.01
time (sec)	N/A	0.193	0.036	0.145	0.000	1.676	0.644	0.431	0.000

Problem 265	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	81	127	105	64	121	0	-1
N.S.	1	1.00	0.64	1.01	0.83	0.51	0.96	0.00	-0.01
time (sec)	N/A	0.143	0.030	0.096	0.483	4.034	0.470	0.000	0.000

Problem 266	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	73	71	0	59	78	81	-1
N.S.	1	1.00	0.82	0.80	0.00	0.66	0.88	0.91	-0.01
time (sec)	N/A	0.101	0.018	0.121	0.000	2.238	0.361	0.452	0.000

Problem 267	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	51	80	49	35	49	49	-1
N.S.	1	1.00	0.93	1.45	0.89	0.64	0.89	0.89	-0.02
time (sec)	N/A	0.050	0.010	0.102	0.476	3.496	0.270	0.447	0.000

Problem 268	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	10	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.77	0.85	0.85
time (sec)	N/A	0.022	0.004	0.078	0.479	1.795	0.219	0.430	0.148

Problem 269	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	116	161	0	0	0	0	-1
N.S.	1	1.00	1.26	1.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.103	0.075	0.136	0.000	0.000	0.000	0.000	0.000

Problem 270	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	72	141	0	0	0	0	-1
N.S.	1	1.00	0.95	1.86	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.109	0.179	0.198	0.000	0.000	0.000	0.000	0.000

Problem 271	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	194	254	0	0	0	0	-1
N.S.	1	1.00	1.19	1.56	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.187	0.969	0.287	0.000	0.000	0.000	0.000	0.000

Problem 272	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	52	14	0	0	0	-1
N.S.	1	1.00	1.00	1.24	0.33	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.028	0.038	0.085	0.483	0.000	0.000	0.000	0.000

Problem 273	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	108	169	0	0	0	0	-1
N.S.	1	1.00	0.60	0.94	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.095	0.153	0.172	0.000	0.000	0.000	0.000	0.000

Problem 274	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	283	283	149	365	0	0	0	0	-1
N.S.	1	1.00	0.53	1.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.166	0.425	0.216	0.000	0.000	0.000	0.000	0.000

Problem 275	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	390	390	234	556	0	0	0	0	-1
N.S.	1	1.00	0.60	1.43	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.243	0.604	0.240	0.000	0.000	0.000	0.000	0.000

Problem 276	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1312	1312	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.209	3.124	9.437	0.000	0.000	0.000	0.000	0.000

Problem 277	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	756	756	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.607	0.101	4.671	0.000	0.000	0.000	0.000	0.000

Problem 278	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	371	371	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.273	0.066	2.286	0.000	0.000	0.000	0.000	0.000

Problem 279	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.064	4.351	0.461	0.000	0.000	0.000	0.000	0.000

Problem 280	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	280	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.299	4.767	0.394	0.000	0.000	0.000	0.000	0.000

Problem 281	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	669	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.657	5.230	0.467	0.000	0.000	0.000	0.000	0.000

Problem 282	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	958	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.910	4.702	7.888	0.000	0.000	0.000	0.000	0.000

Problem 283	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-2)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	500	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.435	0.108	3.488	0.000	0.000	0.000	0.000	0.000

Problem 284	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	204	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.220	0.078	1.443	0.000	0.000	0.000	0.000	0.000

Problem 285	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.098	2.381	0.683	0.000	0.000	0.000	0.000	0.000

Problem 286	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.105	2.851	0.356	0.000	0.000	0.000	0.000	0.000

Problem 287	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	2.966	0.373	0.000	0.000	0.000	0.000	0.000

Problem 288	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.059	0.599	0.678	0.000	0.000	0.000	0.000	0.000

Problem 289	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	370	370	171	278	284	202	355	379	-1
N.S.	1	1.00	0.46	0.75	0.77	0.55	0.96	1.02	-0.00
time (sec)	N/A	0.511	0.147	0.166	0.494	1.415	1.568	0.459	0.000

Problem 290	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	273	273	139	206	216	158	262	267	-1
N.S.	1	1.00	0.51	0.75	0.79	0.58	0.96	0.98	-0.00
time (sec)	N/A	0.294	0.080	0.090	0.506	1.581	0.791	0.442	0.000

Problem 291	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	101	132	128	95	150	139	-1
N.S.	1	1.00	0.64	0.84	0.81	0.60	0.95	0.88	-0.01
time (sec)	N/A	0.147	0.062	0.062	0.489	1.743	0.338	0.437	0.000

Problem 292	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	162	0	36	0	0	0	-1
N.S.	1	1.00	0.81	0.00	0.18	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.098	0.129	0.083	0.615	0.000	0.000	0.000	0.000

Problem 293	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	337	337	234	438	57	0	0	0	-1
N.S.	1	1.00	0.69	1.30	0.17	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.220	0.192	0.292	0.702	0.000	0.000	0.000	0.000

Problem 294	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	455	1544	543	78	0	0	0	-1
N.S.	1	1.00	3.39	1.19	0.17	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.365	12.123	0.312	0.835	0.000	0.000	0.000	0.000

Problem 295	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	533	533	179	699	0	0	0	0	-1
N.S.	1	1.00	0.34	1.31	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.393	0.555	0.249	0.000	0.000	0.000	0.000	0.000

Problem 296	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	365	365	138	474	0	0	0	0	-1
N.S.	1	1.00	0.38	1.30	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.248	0.221	0.180	0.000	0.000	0.000	0.000	0.000

Problem 297	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	114	260	0	0	0	0	-1
N.S.	1	1.00	0.53	1.21	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.122	0.043	0.159	0.000	0.000	0.000	0.000	0.000

Problem 298	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	52	14	0	0	0	-1
N.S.	1	1.00	1.00	1.24	0.33	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.028	0.032	0.089	0.497	0.000	0.000	0.000	0.000

Problem 299	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	238	238	157	203	49	0	0	0	-1
N.S.	1	1.00	0.66	0.85	0.21	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.128	0.191	0.169	0.917	0.000	0.000	0.000	0.000

Problem 300	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	388	388	211	661	106	0	0	0	-1
N.S.	1	1.00	0.54	1.70	0.27	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.217	0.416	0.238	0.669	0.000	0.000	0.000	0.000

Problem 301	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	547	547	319	1017	0	0	0	0	-1
N.S.	1	1.00	0.58	1.86	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.348	0.528	0.281	0.000	0.000	0.000	0.000	0.000

Problem 302	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.059	0.599	0.297	0.000	0.000	0.000	0.000	0.000

Problem 303	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	125	160	0	111	185	192	-1
N.S.	1	1.00	0.65	0.84	0.00	0.58	0.97	1.01	-0.01
time (sec)	N/A	0.324	0.043	0.121	0.000	1.725	0.890	0.442	0.000

Problem 304	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	100	180	131	85	148	0	-1
N.S.	1	1.00	0.64	1.15	0.83	0.54	0.94	0.00	-0.01
time (sec)	N/A	0.228	0.034	0.122	0.479	1.520	0.626	0.000	0.000

Problem 305	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	85	85	0	73	100	108	-1
N.S.	1	1.00	0.79	0.79	0.00	0.68	0.93	1.01	-0.01
time (sec)	N/A	0.150	0.022	0.133	0.000	1.718	0.451	0.468	0.000

Problem 306	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	61	107	64	46	61	62	-1
N.S.	1	1.00	0.91	1.60	0.96	0.69	0.91	0.93	-0.01
time (sec)	N/A	0.078	0.014	0.102	0.460	1.933	0.410	0.451	0.000

Problem 307	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	10	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.77	0.85	0.85
time (sec)	N/A	0.021	0.005	0.089	0.464	7.312	0.250	0.462	0.147

Problem 308	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	180	225	0	0	0	0	-1
N.S.	1	1.00	1.30	1.63	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.118	0.105	0.122	0.000	0.000	0.000	0.000	0.000

Problem 309	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	108	205	0	0	0	0	-1
N.S.	1	1.00	1.09	2.07	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.136	0.152	0.231	0.000	0.000	0.000	0.000	0.000

Problem 310	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	264	264	317	399	0	0	0	0	-1
N.S.	1	1.00	1.20	1.51	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.264	3.023	0.298	0.000	0.000	0.000	0.000	0.000

Problem 311	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	43	42	0	0	0	59	-1
N.S.	1	1.00	0.64	0.63	0.00	0.00	0.00	0.88	-0.01
time (sec)	N/A	0.083	0.070	0.109	0.000	0.000	0.000	0.457	0.000

Problem 312	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	34	33	0	0	0	44	-1
N.S.	1	1.00	0.68	0.66	0.00	0.00	0.00	0.88	-0.02
time (sec)	N/A	0.071	0.050	0.098	0.000	0.000	0.000	0.458	0.000

Problem 313	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	23	22	0	0	0	25	-1
N.S.	1	1.00	0.79	0.76	0.00	0.00	0.00	0.86	-0.03
time (sec)	N/A	0.049	0.019	0.041	0.000	0.000	0.000	0.423	0.000

Problem 314	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.019	1.728	0.207	0.000	0.000	0.000	0.000	0.000

Problem 315	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.018	5.363	1.103	0.000	0.000	0.000	0.000	0.000

Problem 316	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	152	157	0	0	0	472	-1
N.S.	1	1.00	0.74	0.76	0.00	0.00	0.00	2.29	-0.00
time (sec)	N/A	0.292	0.294	0.116	0.000	0.000	0.000	0.447	0.000

Problem 317	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	135	138	0	0	0	0	-1
N.S.	1	1.00	0.74	0.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.285	0.228	0.088	0.000	0.000	0.000	0.000	0.000

Problem 318	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	66	65	0	0	0	169	-1
N.S.	1	1.00	0.80	0.79	0.00	0.00	0.00	2.06	-0.01
time (sec)	N/A	0.161	0.141	0.098	0.000	0.000	0.000	0.457	0.000

Problem 319	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	91	92	0	0	0	172	-1
N.S.	1	1.00	0.75	0.76	0.00	0.00	0.00	1.42	-0.01
time (sec)	N/A	0.180	0.149	0.087	0.000	0.000	0.000	0.444	0.000

Problem 320	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	62	63	0	0	0	102	-1
N.S.	1	1.00	0.76	0.77	0.00	0.00	0.00	1.24	-0.01
time (sec)	N/A	0.104	0.107	0.101	0.000	0.000	0.000	0.435	0.000

Problem 321	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	79	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.275	2.064	0.392	0.000	0.000	0.000	0.000	0.000

Problem 322	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	47	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.205	0.643	0.441	0.000	0.000	0.000	0.000	0.000

Problem 323	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.081	3.713	2.318	0.000	0.000	0.000	0.000	0.000

Problem 324	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.087	0.538	3.289	0.000	0.000	0.000	0.000	0.000

Problem 325	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	179	184	0	0	0	614	-1
N.S.	1	1.00	0.73	0.75	0.00	0.00	0.00	2.51	-0.00
time (sec)	N/A	0.330	0.531	0.095	0.000	0.000	0.000	0.461	0.000

Problem 326	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	165	157	0	0	0	473	-1
N.S.	1	1.00	0.80	0.76	0.00	0.00	0.00	2.30	-0.00
time (sec)	N/A	0.261	0.416	0.093	0.000	0.000	0.000	0.463	0.000

Problem 327	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	136	139	0	0	0	360	-1
N.S.	1	1.00	0.74	0.76	0.00	0.00	0.00	1.97	-0.01
time (sec)	N/A	0.227	0.343	0.091	0.000	0.000	0.000	0.459	0.000

Problem 328	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	121	111	0	0	0	252	-1
N.S.	1	1.00	0.84	0.77	0.00	0.00	0.00	1.75	-0.01
time (sec)	N/A	0.151	0.220	0.098	0.000	0.000	0.000	0.434	0.000

Problem 329	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	140	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.477	2.112	0.478	0.000	0.000	0.000	0.000	0.000

Problem 330	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	107	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.375	0.845	0.375	0.000	0.000	0.000	0.000	0.000

Problem 331	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.091	3.772	2.497	0.000	0.000	0.000	0.000	0.000

Problem 332	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.095	0.549	2.825	0.000	0.000	0.000	0.000	0.000

Problem 333	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	180	185	0	0	0	746	-1
N.S.	1	1.00	0.73	0.76	0.00	0.00	0.00	3.04	-0.00
time (sec)	N/A	0.327	0.807	0.098	0.000	0.000	0.000	0.454	0.000

Problem 334	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	209	203	0	0	0	757	-1
N.S.	1	1.00	0.78	0.76	0.00	0.00	0.00	2.82	-0.00
time (sec)	N/A	0.316	0.710	0.088	0.000	0.000	0.000	0.445	0.000

Problem 335	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	180	185	0	0	0	614	-1
N.S.	1	1.00	0.73	0.76	0.00	0.00	0.00	2.51	-0.00
time (sec)	N/A	0.291	0.651	0.099	0.000	0.000	0.000	0.456	0.000

Problem 336	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	165	157	0	0	0	472	-1
N.S.	1	1.00	0.80	0.76	0.00	0.00	0.00	2.29	-0.00
time (sec)	N/A	0.211	0.465	0.088	0.000	0.000	0.000	0.446	0.000

Problem 337	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	196	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.787	2.095	0.662	0.000	0.000	0.000	0.000	0.000

Problem 338	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	161	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.621	0.780	0.465	0.000	0.000	0.000	0.000	0.000

Problem 339	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.094	3.704	2.535	0.000	0.000	0.000	0.000	0.000

Problem 340	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.093	0.618	3.065	0.000	0.000	0.000	0.000	0.000

Problem 341	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	31	30	0	0	0	35	-1
N.S.	1	1.00	0.76	0.73	0.00	0.00	0.00	0.85	-0.02
time (sec)	N/A	0.107	0.051	0.172	0.000	0.000	0.000	0.420	0.000

Problem 342	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	24	21	0	0	0	0	-1
N.S.	1	1.00	0.89	0.78	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.101	0.044	0.135	0.000	0.000	0.000	0.000	0.000

Problem 343	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	21	0	0	0	23	-1
N.S.	1	1.00	0.81	0.78	0.00	0.00	0.00	0.85	-0.04
time (sec)	N/A	0.102	0.043	0.109	0.000	0.000	0.000	0.420	0.000

Problem 344	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	21	0	0	0	23	-1
N.S.	1	1.00	0.81	0.78	0.00	0.00	0.00	0.85	-0.04
time (sec)	N/A	0.097	0.011	0.000	0.000	0.000	0.000	0.430	0.000

Problem 345	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	10	0	0	0	9	-1
N.S.	1	1.00	1.00	1.11	0.00	0.00	0.00	1.00	-0.11
time (sec)	N/A	0.052	0.036	0.109	0.000	0.000	0.000	0.443	0.000

Problem 346	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	10	9	11	7	10	9
N.S.	1	1.00	1.00	1.11	1.00	1.22	0.78	1.11	1.00
time (sec)	N/A	0.024	0.014	0.090	0.456	1.727	0.225	0.439	0.148

Problem 347	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.059	0.837	0.231	0.000	0.000	0.000	0.000	0.000

Problem 348	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.062	0.075	0.463	0.000	0.000	0.000	0.000	0.000

Problem 349	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	136	139	0	0	0	0	-1
N.S.	1	1.00	0.74	0.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.244	0.213	0.124	0.000	0.000	0.000	0.000	0.000

Problem 350	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	108	111	0	0	0	254	-1
N.S.	1	1.00	0.75	0.77	0.00	0.00	0.00	1.76	-0.01
time (sec)	N/A	0.214	0.165	0.094	0.000	0.000	0.000	0.462	0.000

Problem 351	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	92	93	0	0	0	0	-1
N.S.	1	1.00	0.76	0.77	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.207	0.137	0.108	0.000	0.000	0.000	0.000	0.000

Problem 352	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	64	65	0	0	0	104	-1
N.S.	1	1.00	0.78	0.79	0.00	0.00	0.00	1.27	-0.01
time (sec)	N/A	0.163	0.111	0.102	0.000	0.000	0.000	0.454	0.000

Problem 353	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	45	46	0	0	0	50	-1
N.S.	1	1.00	0.83	0.85	0.00	0.00	0.00	0.93	-0.02
time (sec)	N/A	0.102	0.080	0.092	0.000	0.000	0.000	0.441	0.000

Problem 354	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	C	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	16	19	42	17	16
N.S.	1	1.00	1.00	1.06	1.00	1.19	2.62	1.06	1.00
time (sec)	N/A	0.034	0.034	0.092	0.462	1.907	0.842	0.437	0.178

Problem 355	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.086	1.894	0.111	0.000	0.000	0.000	0.000	0.000

Problem 356	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.087	0.061	0.131	0.000	0.000	0.000	0.000	0.000

Problem 357	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.097	2.780	0.437	0.000	0.000	0.000	0.000	0.000

Problem 358	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.070	6.858	0.307	0.000	0.000	0.000	0.000	0.000

Problem 359	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	0.067	0.179	0.000	0.000	0.000	0.000	0.000

Problem 360	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.094	1.871	2.060	0.000	0.000	0.000	0.000	0.000

Problem 361	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.095	1.352	0.476	0.000	0.000	0.000	0.000	0.000

Problem 362	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.098	3.028	2.355	0.000	0.000	0.000	0.000	0.000

Problem 363	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.064	17.103	1.987	0.000	0.000	0.000	0.000	0.000

Problem 364	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.033	0.070	1.379	0.000	0.000	0.000	0.000	0.000

Problem 365	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.093	4.061	3.930	0.000	0.000	0.000	0.000	0.000

Problem 366	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.096	3.803	4.145	0.000	0.000	0.000	0.000	0.000

Problem 367	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.092	0.654	2.051	0.000	0.000	0.000	0.000	0.000

Problem 368	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.091	0.346	1.878	0.000	0.000	0.000	0.000	0.000

Problem 369	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.080	0.058	1.822	0.000	0.000	0.000	0.000	0.000

Problem 370	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.087	0.415	0.611	0.000	0.000	0.000	0.000	0.000

Problem 371	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.093	0.775	0.917	0.000	0.000	0.000	0.000	0.000

Problem 372	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.094	1.252	0.743	0.000	0.000	0.000	0.000	0.000

Problem 373	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.242	0.199	0.000	0.000	0.000	0.000	0.000

Problem 374	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	83	105	0	0	0	95	-1
N.S.	1	1.00	0.87	1.11	0.00	0.00	0.00	1.00	-0.01
time (sec)	N/A	0.123	0.285	0.237	0.000	0.000	0.000	0.477	0.000

Problem 375	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	70	83	0	0	0	81	-1
N.S.	1	1.00	0.90	1.06	0.00	0.00	0.00	1.04	-0.01
time (sec)	N/A	0.112	0.194	0.098	0.000	0.000	0.000	0.477	0.000

Problem 376	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	55	59	0	0	0	49	-1
N.S.	1	1.00	1.00	1.07	0.00	0.00	0.00	0.89	-0.02
time (sec)	N/A	0.087	0.154	0.065	0.000	0.000	0.000	0.459	0.000

Problem 377	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	59	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.069	2.635	0.243	0.000	0.000	0.000	0.000	0.000

Problem 378	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	60	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.069	9.960	1.070	0.000	0.000	0.000	0.000	0.000

Problem 379	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	0	37	21	0	70	-1
N.S.	1	1.00	1.00	0.00	2.18	1.24	0.00	4.12	-0.06
time (sec)	N/A	0.087	0.083	1.710	0.766	2.119	0.000	0.453	0.000

Problem 380	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.081	0.364	1.928	0.000	0.000	0.000	0.000	0.000

Problem 381	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	175	340	0	0	0	0	-1
N.S.	1	1.00	0.82	1.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.425	0.369	0.109	0.000	0.000	0.000	0.000	0.000

Problem 382	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	82	136	0	0	0	563	-1
N.S.	1	1.00	0.87	1.45	0.00	0.00	0.00	5.99	-0.01
time (sec)	N/A	0.298	0.228	0.102	0.000	0.000	0.000	0.507	0.000

Problem 383	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	125	223	0	0	0	608	-1
N.S.	1	1.00	0.83	1.49	0.00	0.00	0.00	4.05	-0.01
time (sec)	N/A	0.246	0.214	0.092	0.000	0.000	0.000	0.492	0.000

Problem 384	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	72	134	0	0	0	290	-1
N.S.	1	1.00	0.84	1.56	0.00	0.00	0.00	3.37	-0.01
time (sec)	N/A	0.106	0.140	0.099	0.000	0.000	0.000	0.499	0.000

Problem 385	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	105	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.152	7.368	0.767	0.000	0.000	0.000	0.000	0.000

Problem 386	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	57	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.100	1.612	0.667	0.000	0.000	0.000	0.000	0.000

Problem 387	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.083	11.277	3.356	0.000	0.000	0.000	0.000	0.000

Problem 388	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.082	2.538	4.621	0.000	0.000	0.000	0.000	0.000

Problem 389	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.091	0.382	2.253	0.000	0.000	0.000	0.000	0.000

Problem 390	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	399	455	0	0	0	2065	-1
N.S.	1	1.00	1.44	1.64	0.00	0.00	0.00	7.43	-0.00
time (sec)	N/A	0.585	0.742	0.115	0.000	0.000	0.000	0.542	0.000

Problem 391	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	306	364	0	0	0	1553	-1
N.S.	1	1.00	1.39	1.65	0.00	0.00	0.00	7.06	-0.00
time (sec)	N/A	0.380	0.544	0.093	0.000	0.000	0.000	0.538	0.000

Problem 392	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	295	341	0	0	0	1215	-1
N.S.	1	1.00	1.38	1.59	0.00	0.00	0.00	5.68	-0.00
time (sec)	N/A	0.407	0.383	0.096	0.000	0.000	0.000	0.543	0.000

Problem 393	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	122	250	0	0	0	747	-1
N.S.	1	1.00	0.81	1.67	0.00	0.00	0.00	4.98	-0.01
time (sec)	N/A	0.178	0.412	0.101	0.000	0.000	0.000	0.531	0.000

Problem 394	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	177	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.267	7.333	0.770	0.000	0.000	0.000	0.000	0.000

Problem 395	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.165	3.043	0.529	0.000	0.000	0.000	0.000	0.000

Problem 396	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.088	11.249	1.882	0.000	0.000	0.000	0.000	0.000

Problem 397	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	69	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.131	1.892	4.151	0.000	0.000	0.000	0.000	0.000

Problem 398	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.090	0.398	2.467	0.000	0.000	0.000	0.000	0.000

Problem 399	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	408	454	0	0	0	2479	-1
N.S.	1	1.00	1.47	1.63	0.00	0.00	0.00	8.92	-0.00
time (sec)	N/A	0.742	1.072	0.129	0.000	0.000	0.000	0.535	0.000

Problem 400	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	414	478	0	0	0	2461	-1
N.S.	1	1.00	1.47	1.70	0.00	0.00	0.00	8.73	-0.00
time (sec)	N/A	0.545	0.729	0.112	0.000	0.000	0.000	0.555	0.000

Problem 401	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	276	276	404	455	0	0	0	2026	-1
N.S.	1	1.00	1.46	1.65	0.00	0.00	0.00	7.34	-0.00
time (sec)	N/A	0.542	0.663	0.107	0.000	0.000	0.000	0.526	0.000

Problem 402	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	311	364	0	0	0	1394	-1
N.S.	1	1.00	1.43	1.68	0.00	0.00	0.00	6.42	-0.00
time (sec)	N/A	0.236	0.563	0.118	0.000	0.000	0.000	0.517	0.000

Problem 403	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	235	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.343	8.899	0.862	0.000	0.000	0.000	0.000	0.000

Problem 404	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	106	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.222	2.389	0.769	0.000	0.000	0.000	0.000	0.000

Problem 405	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.089	11.270	3.667	0.000	0.000	0.000	0.000	0.000

Problem 406	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.089	2.099	4.269	0.000	0.000	0.000	0.000	0.000

Problem 407	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	49	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.107	0.418	0.717	0.000	0.000	0.000	0.000	0.000

Problem 408	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	157	341	0	0	0	0	-1
N.S.	1	1.00	0.77	1.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.290	0.246	0.124	0.000	0.000	0.000	0.000	0.000

Problem 409	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	117	250	0	0	0	876	-1
N.S.	1	1.00	0.83	1.77	0.00	0.00	0.00	6.21	-0.01
time (sec)	N/A	0.225	0.219	0.123	0.000	0.000	0.000	0.509	0.000

Problem 410	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	113	227	0	0	0	0	-1
N.S.	1	1.00	0.80	1.60	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.222	0.192	0.112	0.000	0.000	0.000	0.000	0.000

Problem 411	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	70	136	0	0	0	346	-1
N.S.	1	1.00	0.89	1.72	0.00	0.00	0.00	4.38	-0.01
time (sec)	N/A	0.154	0.117	0.108	0.000	0.000	0.000	0.503	0.000

Problem 412	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	59	108	0	0	0	200	-1
N.S.	1	1.00	0.82	1.50	0.00	0.00	0.00	2.78	-0.01
time (sec)	N/A	0.110	0.081	0.122	0.000	0.000	0.000	0.512	0.000

Problem 413	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	C	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	18	18	53	18	18
N.S.	1	1.00	1.00	1.06	1.00	1.00	2.94	1.00	1.00
time (sec)	N/A	0.032	0.007	0.101	0.473	1.363	1.506	0.500	0.173

Problem 414	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	47	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.103	5.206	0.131	0.000	0.000	0.000	0.000	0.000

Problem 415	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	47	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.103	0.879	0.161	0.000	0.000	0.000	0.000	0.000

Problem 416	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.092	0.790	0.483	0.000	0.000	0.000	0.000	0.000

Problem 417	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.092	42.759	0.697	0.000	0.000	0.000	0.000	0.000

Problem 418	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	69	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.139	6.217	0.641	0.000	0.000	0.000	0.000	0.000

Problem 419	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.063	41.592	0.283	0.000	0.000	0.000	0.000	0.000

Problem 420	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	64	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.076	1.839	0.241	0.000	0.000	0.000	0.000	0.000

Problem 421	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.092	34.099	2.746	0.000	0.000	0.000	0.000	0.000

Problem 422	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.094	23.019	0.895	0.000	0.000	0.000	0.000	0.000

Problem 423	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.095	1.277	0.817	0.000	0.000	0.000	0.000	0.000

Problem 424	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.094	71.777	3.309	0.000	0.000	0.000	0.000	0.000

Problem 425	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.098	8.769	2.967	0.000	0.000	0.000	0.000	0.000

Problem 426	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.063	73.041	2.172	0.000	0.000	0.000	0.000	0.000

Problem 427	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	64	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.078	2.940	0.477	0.000	0.000	0.000	0.000	0.000

Problem 428	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.092	55.708	5.845	0.000	0.000	0.000	0.000	0.000

Problem 429	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.096	16.920	6.039	0.000	0.000	0.000	0.000	0.000

Problem 430	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	12	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.92	0.85	0.85
time (sec)	N/A	0.022	0.005	0.098	0.468	1.647	0.396	0.454	0.124

Problem 431	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	287	308	0	0	0	0	-1
N.S.	1	1.00	1.14	1.23	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.859	0.978	0.368	0.000	0.000	0.000	0.000	0.000

Problem 432	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	591	591	514	447	0	0	0	0	-1
N.S.	1	1.00	0.87	0.76	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.064	1.019	0.357	0.000	0.000	0.000	0.000	0.000

Problem 433	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	241	241	375	311	0	0	0	0	-1
N.S.	1	1.00	1.56	1.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.450	1.492	0.230	0.000	0.000	0.000	0.000	0.000

Problem 434	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	253	253	348	304	0	0	0	0	-1
N.S.	1	1.00	1.38	1.20	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.363	0.641	0.227	0.000	0.000	0.000	0.000	0.000

Problem 435	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	171	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.480	1.263	0.783	0.000	0.000	0.000	0.000	0.000

Problem 436	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	485	485	540	603	0	0	0	0	-1
N.S.	1	1.00	1.11	1.24	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.012	1.899	0.353	0.000	0.000	0.000	0.000	0.000

Problem 437	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	511	511	686	594	0	0	0	0	-1
N.S.	1	1.00	1.34	1.16	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.342	1.890	0.352	0.000	0.000	0.000	0.000	0.000

Problem 438	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	373	373	509	455	0	0	0	0	-1
N.S.	1	1.00	1.36	1.22	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.819	2.076	0.300	0.000	0.000	0.000	0.000	0.000

Problem 439	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	390	390	522	451	0	0	0	0	-1
N.S.	1	1.00	1.34	1.16	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.525	1.266	0.276	0.000	0.000	0.000	0.000	0.000

Problem 440	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	289	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.884	2.438	0.938	0.000	0.000	0.000	0.000	0.000

Problem 441	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F(-2)	F(-2)	F	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	0	0	0	0	0	46	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	1.10	-0.02
time (sec)	N/A	0.097	3.114	0.009	0.000	0.000	0.000	0.541	0.000

Problem 442	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	166	0	0	0	0	0	-1
N.S.	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.203	0.154	0.323	0.000	0.000	0.000	0.000	0.000

Problem 443	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	138	0	0	0	0	0	-1
N.S.	1	1.00	1.06	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.086	0.046	0.331	0.000	0.000	0.000	0.000	0.000

Problem 444	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0	-1
N.S.	1	1.00	1.00	0.86	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.029	0.031	0.107	0.000	0.000	0.000	0.000	0.000

Problem 445	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	91	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.064	0.432	0.378	0.000	0.000	0.000	0.000	0.000

Problem 446	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	187	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.126	1.212	0.441	0.000	0.000	0.000	0.000	0.000

Problem 447	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	363	363	186	0	0	0	0	0	-1
N.S.	1	1.00	0.51	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.299	0.303	0.292	0.000	0.000	0.000	0.000	0.000

Problem 448	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	158	0	0	0	0	0	-1
N.S.	1	1.00	0.72	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.164	0.076	0.319	0.000	0.000	0.000	0.000	0.000

Problem 449	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0	-1
N.S.	1	1.00	1.00	0.86	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.029	0.041	0.107	0.000	0.000	0.000	0.000	0.000

Problem 450	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	91	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.061	0.517	0.357	0.000	0.000	0.000	0.000	0.000

Problem 451	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	431	431	180	0	0	0	0	0	-1
N.S.	1	1.00	0.42	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.405	0.237	0.292	0.000	0.000	0.000	0.000	0.000

Problem 452	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	247	247	158	0	0	0	0	0	-1
N.S.	1	1.00	0.64	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.176	0.080	0.315	0.000	0.000	0.000	0.000	0.000

Problem 453	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0	-1
N.S.	1	1.00	1.00	0.86	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.027	0.039	0.105	0.000	0.000	0.000	0.000	0.000

Problem 454	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	91	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.060	0.500	0.339	0.000	0.000	0.000	0.000	0.000

Problem 455	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	183	0	0	0	0	0	-1
N.S.	1	1.00	0.81	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.180	0.153	0.325	0.000	0.000	0.000	0.000	0.000

Problem 456	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	148	0	0	0	0	0	-1
N.S.	1	1.00	1.17	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.077	0.057	0.344	0.000	0.000	0.000	0.000	0.000

Problem 457	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	36	0	15	-1
N.S.	1	1.00	1.00	0.90	0.00	0.86	0.00	0.36	-0.02
time (sec)	N/A	0.021	0.022	0.115	0.000	1.786	0.000	0.421	0.000

Problem 458	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	90	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.056	0.413	0.441	0.000	0.000	0.000	0.000	0.000

Problem 459	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	185	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.114	1.224	0.404	0.000	0.000	0.000	0.000	0.000

Problem 460	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	359	359	209	0	0	0	0	0	-1
N.S.	1	1.00	0.58	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.301	0.297	0.280	0.000	0.000	0.000	0.000	0.000

Problem 461	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	173	0	0	0	0	0	-1
N.S.	1	1.00	0.80	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.164	0.093	0.414	0.000	0.000	0.000	0.000	0.000

Problem 462	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	38	0	15	-1
N.S.	1	1.00	1.00	0.90	0.00	0.90	0.00	0.36	-0.02
time (sec)	N/A	0.020	0.028	0.099	0.000	2.093	0.000	0.407	0.000

Problem 463	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	90	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.051	0.487	0.297	0.000	0.000	0.000	0.000	0.000

Problem 464	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	53	20	0	0	0	37	-1
N.S.	1	1.00	2.12	0.80	0.00	0.00	0.00	1.48	-0.04
time (sec)	N/A	0.044	0.054	0.293	0.000	0.000	0.000	0.416	0.000

Problem 465	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	336	0	0	0	0	0	-1
N.S.	1	1.00	1.38	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.112	0.436	0.318	0.000	0.000	0.000	0.000	0.000

Problem 466	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	182	0	0	0	0	0	-1
N.S.	1	1.00	1.07	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.091	0.207	0.300	0.000	0.000	0.000	0.000	0.000

Problem 467	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	118	0	0	0	0	0	-1
N.S.	1	1.00	1.19	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.063	0.097	0.335	0.000	0.000	0.000	0.000	0.000

Problem 468	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	0	0	0	-1
N.S.	1	1.00	1.00	0.90	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.030	0.031	0.111	0.000	0.000	0.000	0.000	0.000

Problem 469	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.028	0.615	0.349	0.000	0.000	0.000	0.000	0.000

Problem 470	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.028	1.408	0.417	0.000	0.000	0.000	0.000	0.000

Problem 471	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	404	0	0	0	0	0	-1
N.S.	1	1.00	1.70	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.137	0.726	0.303	0.000	0.000	0.000	0.000	0.000

Problem 472	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	211	0	0	0	0	0	-1
N.S.	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.104	0.257	0.293	0.000	0.000	0.000	0.000	0.000

Problem 473	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	83	0	0	0	0	0	-1
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.060	0.111	0.328	0.000	0.000	0.000	0.000	0.000

Problem 474	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	48	0	0	-1
N.S.	1	1.00	1.00	0.90	0.00	1.14	0.00	0.00	-0.02
time (sec)	N/A	0.030	0.029	0.100	0.000	2.071	0.000	0.000	0.000

Problem 475	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	103	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.060	0.598	0.362	0.000	0.000	0.000	0.000	0.000

Problem 476	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	103	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.062	1.311	0.432	0.000	0.000	0.000	0.000	0.000

Problem 477	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	251	0	0	0	0	0	-1
N.S.	1	1.00	1.22	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.202	0.895	0.299	0.000	0.000	0.000	0.000	0.000

Problem 478	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	142	0	0	0	0	0	-1
N.S.	1	1.00	1.09	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.055	0.271	0.336	0.000	0.000	0.000	0.000	0.000

Problem 479	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	48	0	0	-1
N.S.	1	1.00	1.00	0.86	0.00	1.09	0.00	0.00	-0.02
time (sec)	N/A	0.030	0.027	0.109	0.000	1.710	0.000	0.000	0.000

Problem 480	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	107	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.065	0.600	0.369	0.000	0.000	0.000	0.000	0.000

Problem 481	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	107	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.064	1.298	0.438	0.000	0.000	0.000	0.000	0.000

Problem 482	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	259	189	0	0	0	0	0	-1
N.S.	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.243	0.584	0.473	0.000	0.000	0.000	0.000	0.000

Problem 483	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	391	391	272	0	0	0	0	0	-1
N.S.	1	1.00	0.70	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.265	0.583	0.201	0.000	0.000	0.000	0.000	0.000

Problem 484	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	259	182	0	0	0	0	0	-1
N.S.	1	1.00	0.70	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.171	0.524	0.188	0.000	0.000	0.000	0.000	0.000

Problem 485	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	219	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.372	0.137	0.471	0.000	0.000	0.000	0.000	0.000

Problem 486	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	88	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.252	0.193	0.339	0.000	0.000	0.000	0.000	0.000

Problem 487	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	684	684	436	0	0	0	0	0	-1
N.S.	1	1.00	0.64	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.452	1.983	0.438	0.000	0.000	0.000	0.000	0.000

Problem 488	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	595	595	464	0	0	0	0	0	-1
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.344	1.395	0.152	0.000	0.000	0.000	0.000	0.000

Problem 489	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	466	466	326	0	0	0	0	0	-1
N.S.	1	1.00	0.70	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.246	1.061	0.103	0.000	0.000	0.000	0.000	0.000

Problem 490	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	427	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.698	0.149	0.188	0.000	0.000	0.000	0.000	0.000

Problem 491	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	298	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.530	0.517	0.335	0.000	0.000	0.000	0.000	0.000

Problem 492	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	906	906	989	0	0	0	0	0	-1
N.S.	1	1.00	1.09	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.558	2.659	0.420	0.000	0.000	0.000	0.000	0.000

Problem 493	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	815	815	603	0	0	0	0	0	-1
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.435	2.597	0.145	0.000	0.000	0.000	0.000	0.000

Problem 494	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	698	698	477	0	0	0	0	0	-1
N.S.	1	1.00	0.68	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.347	2.884	0.108	0.000	0.000	0.000	0.000	0.000

Problem 495	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-2)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	827	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.100	0.157	0.190	0.000	0.000	0.000	0.000	0.000

Problem 496	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-2)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	502	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.876	0.528	0.330	0.000	0.000	0.000	0.000	0.000

Problem 497	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.066	0.348	0.264	0.000	0.000	0.000	0.000	0.000

Problem 498	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	153	0	0	0	0	0	-1
N.S.	1	1.00	0.94	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.168	0.227	0.388	0.000	0.000	0.000	0.000	0.000

Problem 499	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	109	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.143	0.183	0.335	0.000	0.000	0.000	0.000	0.000

Problem 500	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	70	0	0	0	0	0	-1
N.S.	1	1.00	0.93	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.084	0.053	0.065	0.000	0.000	0.000	0.000	0.000

Problem 501	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	17	18	34	17	33
N.S.	1	1.00	1.00	1.06	1.00	1.06	2.00	1.00	1.94
time (sec)	N/A	0.026	0.007	0.110	0.480	2.207	0.358	0.411	0.306

Problem 502	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.068	2.354	0.148	0.000	0.000	0.000	0.000	0.000

Problem 503	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	0.685	0.228	0.000	0.000	0.000	0.000	0.000

Problem 504	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	376	376	293	0	0	0	0	0	-1
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.385	0.847	0.132	0.000	0.000	0.000	0.000	0.000

Problem 505	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	273	273	260	0	0	0	0	0	-1
N.S.	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.215	0.555	0.120	0.000	0.000	0.000	0.000	0.000

Problem 506	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	207	0	0	0	0	0	-1
N.S.	1	1.00	1.54	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.116	0.307	0.118	0.000	0.000	0.000	0.000	0.000

Problem 507	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	200	0	0	0	0	0	-1
N.S.	1	1.00	1.42	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.185	0.388	0.135	0.000	0.000	0.000	0.000	0.000

Problem 508	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	248	0	0	0	0	0	-1
N.S.	1	1.00	1.53	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.260	0.745	0.344	0.000	0.000	0.000	0.000	0.000

Problem 509	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	114	0	215	520	0	0	-1
N.S.	1	1.00	0.70	0.00	1.32	3.19	0.00	0.00	-0.01
time (sec)	N/A	0.195	0.274	0.129	0.496	3.503	0.000	0.000	0.000

Problem 510	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	414	414	305	0	0	0	0	0	-1
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.278	0.937	0.124	0.000	0.000	0.000	0.000	0.000

Problem 511	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	247	0	0	0	0	0	-1
N.S.	1	1.00	1.09	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.161	0.596	0.119	0.000	0.000	0.000	0.000	0.000

Problem 512	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	273	273	260	0	0	0	0	0	-1
N.S.	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.215	0.593	0.121	0.000	0.000	0.000	0.000	0.000

Problem 513	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	238	0	0	0	0	0	-1
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.303	0.649	0.133	0.000	0.000	0.000	0.000	0.000

Problem 514	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	291	0	0	0	0	0	-1
N.S.	1	1.00	1.15	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.298	2.022	0.280	0.000	0.000	0.000	0.000	0.000

Problem 515	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	324	324	599	0	0	0	0	0	-1
N.S.	1	1.00	1.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.247	3.207	0.285	0.000	0.000	0.000	0.000	0.000

Problem 516	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	315	315	303	0	0	0	0	0	-1
N.S.	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.191	0.976	0.130	0.000	0.000	0.000	0.000	0.000

Problem 517	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	414	414	305	0	0	0	0	0	-1
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.281	0.886	0.121	0.000	0.000	0.000	0.000	0.000

Problem 518	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	376	376	293	0	0	0	0	0	-1
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.383	0.698	0.124	0.000	0.000	0.000	0.000	0.000

Problem 519	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	345	345	274	0	0	0	0	0	-1
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.408	1.036	0.135	0.000	0.000	0.000	0.000	0.000

Problem 520	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	465	465	685	0	0	0	0	0	-1
N.S.	1	1.00	1.47	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.269	2.016	0.296	0.000	0.000	0.000	0.000	0.000

Problem 521	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	420	420	847	0	0	0	0	0	-1
N.S.	1	1.00	2.02	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.276	3.827	0.296	0.000	0.000	0.000	0.000	0.000

Problem 522	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	345	345	270	0	0	0	0	0	-1
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.404	1.271	0.135	0.000	0.000	0.000	0.000	0.000

Problem 523	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	238	0	0	0	0	0	-1
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.311	0.626	0.138	0.000	0.000	0.000	0.000	0.000

Problem 524	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	200	0	0	0	0	0	-1
N.S.	1	1.00	1.42	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.185	0.373	0.135	0.000	0.000	0.000	0.000	0.000

Problem 525	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	110	0	32	0	0	0	-1
N.S.	1	1.00	2.00	0.00	0.58	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.106	0.280	0.128	0.487	0.000	0.000	0.000	0.000

Problem 526	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	79	0	96	348	0	0	-1
N.S.	1	1.00	0.80	0.00	0.97	3.52	0.00	0.00	-0.01
time (sec)	N/A	0.149	0.177	0.132	0.491	2.618	0.000	0.000	0.000

Problem 527	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	265	265	118	0	223	525	0	0	-1
N.S.	1	1.00	0.45	0.00	0.84	1.98	0.00	0.00	-0.00
time (sec)	N/A	0.215	0.220	0.132	0.497	2.442	0.000	0.000	0.000

Problem 528	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	463	463	768	0	0	0	0	0	-1
N.S.	1	1.00	1.66	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.263	2.520	0.300	0.000	0.000	0.000	0.000	0.000

Problem 529	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	514	0	0	0	0	0	-1
N.S.	1	1.00	2.04	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.302	1.719	0.295	0.000	0.000	0.000	0.000	0.000

Problem 530	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	281	0	0	0	0	0	-1
N.S.	1	1.00	1.73	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.250	0.891	0.300	0.000	0.000	0.000	0.000	0.000

Problem 531	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	106	0	98	354	0	0	-1
N.S.	1	1.00	1.08	0.00	1.00	3.61	0.00	0.00	-0.01
time (sec)	N/A	0.146	0.220	0.132	0.494	3.425	0.000	0.000	0.000

Problem 532	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	105	0	86	0	0	0	-1
N.S.	1	1.00	1.09	0.00	0.90	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.120	0.240	0.134	0.486	0.000	0.000	0.000	0.000

Problem 533	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	180	0	234	0	0	0	-1
N.S.	1	1.00	0.71	0.00	0.92	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.188	0.328	0.133	0.495	0.000	0.000	0.000	0.000

Problem 534	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	419	419	850	0	0	0	0	0	-1
N.S.	1	1.00	2.03	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.267	3.520	0.298	0.000	0.000	0.000	0.000	0.000

Problem 535	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	324	324	601	0	0	0	0	0	-1
N.S.	1	1.00	1.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.247	2.549	0.292	0.000	0.000	0.000	0.000	0.000

Problem 536	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	126	0	217	520	0	0	-1
N.S.	1	1.00	0.77	0.00	1.32	3.17	0.00	0.00	-0.01
time (sec)	N/A	0.181	0.261	0.132	0.495	1.472	0.000	0.000	0.000

Problem 537	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	265	265	130	0	227	527	0	0	-1
N.S.	1	1.00	0.49	0.00	0.86	1.99	0.00	0.00	-0.00
time (sec)	N/A	0.207	0.244	0.135	0.503	2.553	0.000	0.000	0.000

Problem 538	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	184	0	237	0	0	0	-1
N.S.	1	1.00	0.72	0.00	0.93	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.183	0.330	0.134	0.510	0.000	0.000	0.000	0.000

Problem 539	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	178	0	177	0	0	0	-1
N.S.	1	1.00	0.95	0.00	0.94	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.156	0.299	0.132	0.502	0.000	0.000	0.000	0.000

Problem 540	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	613	613	555	0	0	0	0	0	-1
N.S.	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.715	1.433	0.155	0.000	0.000	0.000	0.000	0.000

Problem 541	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	455	437	0	0	0	0	0	-1
N.S.	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.422	1.075	0.152	0.000	0.000	0.000	0.000	0.000

Problem 542	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	288	0	0	0	0	0	-1
N.S.	1	1.00	1.30	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.210	0.582	0.149	0.000	0.000	0.000	0.000	0.000

Problem 543	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	296	0	0	0	0	0	-1
N.S.	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.323	0.575	0.161	0.000	0.000	0.000	0.000	0.000

Problem 544	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	530	530	547	0	0	0	0	0	-1
N.S.	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.673	2.341	0.255	0.000	0.000	0.000	0.000	0.000

Problem 545	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	486	486	527	0	0	0	0	0	-1
N.S.	1	1.00	1.08	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.769	5.775	0.164	0.000	0.000	0.000	0.000	0.000

Problem 546	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	697	697	574	0	0	0	0	0	-1
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.535	2.296	0.151	0.000	0.000	0.000	0.000	0.000

Problem 547	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	362	362	373	0	0	0	0	0	-1
N.S.	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.299	1.137	0.154	0.000	0.000	0.000	0.000	0.000

Problem 548	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	455	440	0	0	0	0	0	-1
N.S.	1	1.00	0.97	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.407	1.100	0.152	0.000	0.000	0.000	0.000	0.000

Problem 549	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	398	398	358	0	0	0	0	0	-1
N.S.	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.403	1.281	0.167	0.000	0.000	0.000	0.000	0.000

Problem 550	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	714	714	1086	0	0	0	0	0	-1
N.S.	1	1.00	1.52	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.756	4.781	0.257	0.000	0.000	0.000	0.000	0.000

Problem 551	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	544	544	1438	0	0	0	0	0	-1
N.S.	1	1.00	2.64	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.790	8.258	0.246	0.000	0.000	0.000	0.000	0.000

Problem 552	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	502	502	450	0	0	0	0	0	-1
N.S.	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.368	1.702	0.152	0.000	0.000	0.000	0.000	0.000

Problem 553	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	697	697	574	0	0	0	0	0	-1
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.528	2.317	0.152	0.000	0.000	0.000	0.000	0.000

Problem 554	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	613	613	555	0	0	0	0	0	-1
N.S.	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.705	1.428	0.152	0.000	0.000	0.000	0.000	0.000

Problem 555	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	559	559	473	0	0	0	0	0	-1
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.481	1.894	0.181	0.000	0.000	0.000	0.000	0.000

Problem 556	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	918	918	1642	0	0	0	0	0	-1
N.S.	1	1.00	1.79	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.919	8.217	0.250	0.000	0.000	0.000	0.000	0.000

Problem 557	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	729	729	2338	0	0	0	0	0	-1
N.S.	1	1.00	3.21	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.915	10.151	0.247	0.000	0.000	0.000	0.000	0.000

Problem 558	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	559	559	434	0	0	0	0	0	-1
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.451	2.131	0.166	0.000	0.000	0.000	0.000	0.000

Problem 559	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	398	398	344	0	0	0	0	0	-1
N.S.	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.385	1.225	0.167	0.000	0.000	0.000	0.000	0.000

Problem 560	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	298	0	0	0	0	0	-1
N.S.	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.298	0.561	0.162	0.000	0.000	0.000	0.000	0.000

Problem 561	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	159	0	53	0	0	0	-1
N.S.	1	1.00	2.89	0.00	0.96	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.163	0.488	0.158	0.514	0.000	0.000	0.000	0.000

Problem 562	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	455	225	0	0	0	0	0	-1
N.S.	1	1.00	0.49	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.475	1.130	0.166	0.000	0.000	0.000	0.000	0.000

Problem 563	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	896	896	369	0	0	0	0	0	-1
N.S.	1	1.00	0.41	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.858	5.955	0.161	0.000	0.000	0.000	0.000	0.000

Problem 564	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	918	918	2041	0	0	0	0	0	-1
N.S.	1	1.00	2.22	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.870	11.007	0.241	0.000	0.000	0.000	0.000	0.000

Problem 565	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	713	713	1255	0	0	0	0	0	-1
N.S.	1	1.00	1.76	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.718	8.843	0.249	0.000	0.000	0.000	0.000	0.000

Problem 566	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	530	530	513	0	0	0	0	0	-1
N.S.	1	1.00	0.97	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.629	3.826	0.261	0.000	0.000	0.000	0.000	0.000

Problem 567	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	454	454	221	0	0	0	0	0	-1
N.S.	1	1.00	0.49	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.459	1.071	0.164	0.000	0.000	0.000	0.000	0.000

Problem 568	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	550	0	0	0	0	0	-1
N.S.	1	1.00	2.53	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.258	0.724	0.164	0.000	0.000	0.000	0.000	0.000

Problem 569	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	709	709	739	0	0	0	0	0	-1
N.S.	1	1.00	1.04	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.578	7.381	0.167	0.000	0.000	0.000	0.000	0.000

Problem 570	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	730	730	2312	0	0	0	0	0	-1
N.S.	1	1.00	3.17	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.908	10.439	0.246	0.000	0.000	0.000	0.000	0.000

Problem 571	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	544	544	1419	0	0	0	0	0	-1
N.S.	1	1.00	2.61	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.766	8.501	0.248	0.000	0.000	0.000	0.000	0.000

Problem 572	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	486	486	507	0	0	0	0	0	-1
N.S.	1	1.00	1.04	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.721	6.014	0.161	0.000	0.000	0.000	0.000	0.000

Problem 573	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	896	896	388	0	0	0	0	0	-1
N.S.	1	1.00	0.43	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.820	4.504	0.165	0.000	0.000	0.000	0.000	0.000

Problem 574	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	709	709	764	0	0	0	0	0	-1
N.S.	1	1.00	1.08	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.580	7.434	0.162	0.000	0.000	0.000	0.000	0.000

Problem 575	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	366	366	722	0	0	0	0	0	-1
N.S.	1	1.00	1.97	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.332	5.898	0.164	0.000	0.000	0.000	0.000	0.000

Problem 576	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	351	351	297	0	0	0	0	0	-1
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.499	0.640	0.716	0.000	0.000	0.000	0.000	0.000

Problem 577	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	178	0	227	212	0	0	-1
N.S.	1	1.00	0.79	0.00	1.01	0.94	0.00	0.00	-0.00
time (sec)	N/A	0.274	0.243	0.260	0.495	0.972	0.000	0.000	0.000

Problem 578	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	288	0	0	0	0	0	-1
N.S.	1	1.00	1.30	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.201	0.586	0.000	0.000	0.000	0.000	0.000	0.000

Problem 579	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	432	432	434	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.479	1.267	0.173	0.000	0.000	0.000	0.000	0.000

Problem 580	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	374	0	0	0	0	0	-1
N.S.	1	1.00	1.46	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.420	0.702	1.053	0.000	0.000	0.000	0.000	0.000

Problem 581	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	509	509	452	0	0	0	0	0	-1
N.S.	1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.736	1.329	0.588	0.000	0.000	0.000	0.000	0.000

Problem 582	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	338	338	207	0	281	313	0	0	-1
N.S.	1	1.00	0.61	0.00	0.83	0.93	0.00	0.00	-0.00
time (sec)	N/A	0.347	0.377	0.279	0.540	1.991	0.000	0.000	0.000

Problem 583	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	362	362	373	0	0	0	0	0	-1
N.S.	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.312	0.468	0.000	0.000	0.000	0.000	0.000	0.000

Problem 584	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	647	647	632	0	0	0	0	0	-1
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.699	2.920	0.165	0.000	0.000	0.000	0.000	0.000

Problem 585	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	505	505	538	0	0	0	0	0	-1
N.S.	1	1.00	1.07	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.601	1.392	1.016	0.000	0.000	0.000	0.000	0.000

Problem 586	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	326	0	0	0	0	0	-1
N.S.	1	1.00	1.30	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.415	0.783	0.602	0.000	0.000	0.000	0.000	0.000

Problem 587	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	150	0	157	153	0	0	-1
N.S.	1	1.00	0.85	0.00	0.89	0.86	0.00	0.00	-0.01
time (sec)	N/A	0.261	0.285	0.815	0.517	2.313	0.000	0.000	0.000

Problem 588	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	159	0	53	0	0	0	-1
N.S.	1	1.00	2.89	0.00	0.96	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.159	0.455	0.000	0.498	0.000	0.000	0.000	0.000

Problem 589	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	336	0	0	0	0	0	-1
N.S.	1	1.00	1.17	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.406	0.837	0.164	0.000	0.000	0.000	0.000	0.000

Problem 590	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	189	0	0	0	0	0	-1
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.418	0.698	1.355	0.000	0.000	0.000	0.000	0.000

Problem 591	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	295	295	636	0	0	0	0	0	-1
N.S.	1	1.00	2.16	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.529	1.506	0.525	0.000	0.000	0.000	0.000	0.000

Problem 592	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	453	0	0	0	0	0	-1
N.S.	1	1.00	1.86	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.346	0.686	0.832	0.000	0.000	0.000	0.000	0.000

Problem 593	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	550	0	0	0	0	0	-1
N.S.	1	1.00	2.53	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.267	0.233	0.000	0.000	0.000	0.000	0.000	0.000

Problem 594	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	548	548	877	0	0	0	0	0	-1
N.S.	1	1.00	1.60	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.599	3.283	0.167	0.000	0.000	0.000	0.000	0.000

Problem 595	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	396	396	564	0	0	0	0	0	-1
N.S.	1	1.00	1.42	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.604	1.579	1.325	0.000	0.000	0.000	0.000	0.000

Problem 596	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	115	201	185	131	223	316	-1
N.S.	1	1.00	0.76	1.32	1.22	0.86	1.47	2.08	-0.01
time (sec)	N/A	0.114	0.082	0.198	0.494	2.469	0.750	0.446	0.000

Problem 597	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	116	177	165	126	206	254	-1
N.S.	1	1.00	0.78	1.19	1.11	0.85	1.38	1.70	-0.01
time (sec)	N/A	0.089	0.063	0.096	0.538	1.646	0.529	0.403	0.000

Problem 598	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	96	161	144	112	172	210	-1
N.S.	1	1.00	0.80	1.34	1.20	0.93	1.43	1.75	-0.01
time (sec)	N/A	0.093	0.070	0.113	0.486	0.957	0.421	0.401	0.000

Problem 599	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	95	172	124	106	153	168	-1
N.S.	1	1.00	0.78	1.41	1.02	0.87	1.25	1.38	-0.01
time (sec)	N/A	0.066	0.051	0.139	0.484	1.030	0.278	0.426	0.000

Problem 600	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	71	111	93	86	109	109	-1
N.S.	1	1.00	0.88	1.37	1.15	1.06	1.35	1.35	-0.01
time (sec)	N/A	0.054	0.050	0.006	0.483	1.106	0.172	0.418	0.000

Problem 601	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	126	167	0	0	0	0	-1
N.S.	1	1.00	0.95	1.27	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.184	0.132	0.365	0.000	0.000	0.000	0.000	0.000

Problem 602	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	71	79	81	106	75	1032	70
N.S.	1	1.00	1.08	1.20	1.23	1.61	1.14	15.64	1.06
time (sec)	N/A	0.058	0.041	0.010	0.501	1.715	2.440	0.568	0.357

Problem 603	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	104	201	0	0	0	0	-1
N.S.	1	1.00	0.87	1.69	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.165	0.085	0.820	0.000	0.000	0.000	0.000	0.000

Problem 604	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	109	120	121	125	168	424	-1
N.S.	1	1.00	1.28	1.41	1.42	1.47	1.98	4.99	-0.01
time (sec)	N/A	0.065	0.037	0.010	0.474	1.197	3.208	121.536	0.000

Problem 605	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	241	241	187	339	314	216	415	598	-1
N.S.	1	1.00	0.78	1.41	1.30	0.90	1.72	2.48	-0.00
time (sec)	N/A	0.234	0.142	0.141	0.486	1.499	1.743	0.418	0.000

Problem 606	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	241	241	190	303	284	214	382	498	-1
N.S.	1	1.00	0.79	1.26	1.18	0.89	1.59	2.07	-0.00
time (sec)	N/A	0.181	0.115	0.134	0.470	1.214	1.132	0.443	0.000

Problem 607	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	158	279	253	185	333	429	-1
N.S.	1	1.00	0.80	1.41	1.28	0.93	1.68	2.17	-0.01
time (sec)	N/A	0.164	0.117	0.141	0.501	1.639	0.868	0.412	0.000

Problem 608	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	159	264	223	181	299	350	-1
N.S.	1	1.00	0.87	1.44	1.22	0.99	1.63	1.91	-0.01
time (sec)	N/A	0.131	0.105	0.128	0.474	1.136	0.697	0.417	0.000

Problem 609	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	125	209	182	149	240	265	-1
N.S.	1	1.00	0.83	1.39	1.21	0.99	1.60	1.77	-0.01
time (sec)	N/A	0.103	0.099	0.093	0.479	0.944	0.365	0.439	0.000

Problem 610	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	218	262	0	0	0	0	-1
N.S.	1	1.00	0.95	1.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.236	0.216	0.309	0.000	0.000	0.000	0.000	0.000

Problem 611	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	129	168	151	170	167	4243	-1
N.S.	1	1.00	1.02	1.33	1.20	1.35	1.33	33.67	-0.01
time (sec)	N/A	0.131	0.105	0.109	0.476	1.066	3.419	1.916	0.000

Problem 612	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	184	281	0	0	0	0	-1
N.S.	1	1.00	0.99	1.52	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.247	0.260	0.797	0.000	0.000	0.000	0.000	0.000

Problem 613	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	140	156	159	181	218	2534	-1
N.S.	1	1.00	1.11	1.24	1.26	1.44	1.73	20.11	-0.01
time (sec)	N/A	0.146	0.126	0.105	0.508	3.085	4.196	1.556	0.000

Problem 614	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	341	341	271	497	463	313	631	943	-1
N.S.	1	1.00	0.79	1.46	1.36	0.92	1.85	2.77	-0.00
time (sec)	N/A	0.309	0.197	0.138	0.487	2.720	3.759	0.431	0.000

Problem 615	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	380	380	276	449	423	312	597	807	-1
N.S.	1	1.00	0.73	1.18	1.11	0.82	1.57	2.12	-0.00
time (sec)	N/A	0.355	0.169	0.131	0.500	2.215	2.731	0.437	0.000

Problem 616	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	231	417	382	270	525	711	-1
N.S.	1	1.00	0.80	1.45	1.33	0.94	1.83	2.48	-0.00
time (sec)	N/A	0.262	0.155	0.142	0.499	2.398	1.688	0.420	0.000

Problem 617	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	232	376	342	267	483	597	-1
N.S.	1	1.00	0.90	1.46	1.33	1.03	1.87	2.31	-0.00
time (sec)	N/A	0.197	0.139	0.128	0.497	1.804	1.203	0.425	0.000

Problem 618	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	187	325	290	222	389	480	-1
N.S.	1	1.00	0.83	1.44	1.29	0.99	1.73	2.13	-0.00
time (sec)	N/A	0.183	0.133	0.089	0.492	1.061	0.774	0.427	0.000

Problem 619	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	357	357	322	391	0	0	0	0	-1
N.S.	1	1.00	0.90	1.10	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.335	0.331	0.280	0.000	0.000	0.000	0.000	0.000

Problem 620	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	183	264	239	232	272	10769	-1
N.S.	1	1.00	0.96	1.39	1.26	1.22	1.43	56.68	-0.01
time (sec)	N/A	0.189	0.143	0.097	0.482	2.318	4.708	11.476	0.000

Problem 621	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	262	262	262	396	0	0	0	0	-1
N.S.	1	1.00	1.00	1.51	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.559	0.255	0.494	0.000	0.000	0.000	0.000	0.000

Problem 622	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	194	249	229	249	309	7971	-1
N.S.	1	1.00	1.04	1.34	1.23	1.34	1.66	42.85	-0.01
time (sec)	N/A	0.231	0.181	0.100	0.504	1.898	5.779	8.063	0.000

Problem 623	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	317	317	260	465	420	307	593	766	-1
N.S.	1	1.00	0.82	1.47	1.32	0.97	1.87	2.42	-0.00
time (sec)	N/A	0.244	0.172	0.098	0.482	2.302	1.573	0.420	0.000

Problem 624	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	653	653	515	394	0	0	0	0	-1
N.S.	1	1.00	0.79	0.60	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.775	0.571	12.527	0.000	0.000	0.000	0.000	0.000

Problem 625	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	559	559	475	2912	0	0	0	0	-1
N.S.	1	1.00	0.85	5.21	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.634	0.256	0.956	0.000	0.000	0.000	0.000	0.000

Problem 626	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	579	579	456	300	0	0	0	0	-1
N.S.	1	1.00	0.79	0.52	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.633	0.226	2.021	0.000	0.000	0.000	0.000	0.000

Problem 627	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	491	491	399	2789	0	0	0	0	-1
N.S.	1	1.00	0.81	5.68	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.515	0.097	0.266	0.000	0.000	0.000	0.000	0.000

Problem 628	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	541	541	490	243	0	0	0	0	-1
N.S.	1	1.00	0.91	0.45	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.525	0.302	0.137	0.000	0.000	0.000	0.000	0.000

Problem 629	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	518	518	441	352	0	0	0	0	-1
N.S.	1	1.00	0.85	0.68	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.654	0.482	0.371	0.000	0.000	0.000	0.000	0.000

Problem 630	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	579	579	455	369	0	0	0	0	-1
N.S.	1	1.00	0.79	0.64	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.651	0.220	1.451	0.000	0.000	0.000	0.000	0.000

Problem 631	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	573	573	483	446	0	0	0	0	-1
N.S.	1	1.00	0.84	0.78	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.667	1.473	0.457	0.000	0.000	0.000	0.000	0.000

Problem 632	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	649	649	531	488	0	0	0	0	-1
N.S.	1	1.00	0.82	0.75	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.697	0.248	1.354	0.000	0.000	0.000	0.000	0.000

Problem 633	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	574	574	593	2962	0	0	0	0	-1
N.S.	1	1.00	1.03	5.16	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.702	0.741	0.872	0.000	0.000	0.000	0.000	0.000

Problem 634	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	83	87	418	0	417	0	0	-1
N.S.	1	0.97	1.01	4.86	0.00	4.85	0.00	0.00	-0.01
time (sec)	N/A	0.042	0.099	2.125	0.000	2.029	0.000	0.000	0.000

Problem 635	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	597	597	0	488	0	0	0	0	-1
N.S.	1	1.00	0.00	0.82	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.724	2.314	0.461	0.000	0.000	0.000	0.000	0.000

Problem 636	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	632	632	0	694	0	0	0	0	-1
N.S.	1	1.00	0.00	1.10	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.738	3.851	0.536	0.000	0.000	0.000	0.000	0.000

Problem 637	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	787	787	649	1765	0	0	0	0	-1
N.S.	1	1.00	0.82	2.24	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.474	1.001	8.150	0.000	0.000	0.000	0.000	0.000

Problem 638	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	745	745	603	1698	0	0	0	0	-1
N.S.	1	1.00	0.81	2.28	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.392	0.768	1.738	0.000	0.000	0.000	0.000	0.000

Problem 639	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	757	757	591	1706	0	0	0	0	-1
N.S.	1	1.00	0.78	2.25	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.704	1.142	3.223	0.000	0.000	0.000	0.000	0.000

Problem 640	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	795	795	672	1839	0	0	0	0	-1
N.S.	1	1.00	0.85	2.31	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.436	0.980	6.029	0.000	0.000	0.000	0.000	0.000

Problem 641	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	705	705	973	5185	0	0	0	0	-1
N.S.	1	1.00	1.38	7.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.798	4.612	6.320	0.000	0.000	0.000	0.000	0.000

Problem 642	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	152	1060	0	939	0	0	-1
N.S.	1	1.00	0.99	6.93	0.00	6.14	0.00	0.00	-0.01
time (sec)	N/A	0.144	0.356	0.108	0.000	2.459	0.000	0.000	0.000

Problem 643	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	141	1021	0	793	0	0	-1
N.S.	1	1.00	1.06	7.68	0.00	5.96	0.00	0.00	-0.01
time (sec)	N/A	0.068	0.393	0.115	0.000	8.009	0.000	0.000	0.000

Problem 644	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	727	727	0	1373	0	0	0	0	-1
N.S.	1	1.00	0.00	1.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.816	4.694	0.668	0.000	0.000	0.000	0.000	0.000

Problem 645	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	783	783	0	1820	0	0	0	0	-1
N.S.	1	1.00	0.00	2.32	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.857	6.325	0.678	0.000	0.000	0.000	0.000	0.000

Problem 646	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1082	1082	1014	3126	0	0	0	0	-1
N.S.	1	1.00	0.94	2.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.413	3.969	8.032	0.000	0.000	0.000	0.000	0.000

Problem 647	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1092	1092	1014	2278	0	0	0	0	-1
N.S.	1	1.00	0.93	2.09	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.827	4.245	4.095	0.000	0.000	0.000	0.000	0.000

Problem 648	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1092	1092	1033	3127	0	0	0	0	-1
N.S.	1	1.00	0.95	2.86	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.880	4.161	1.897	0.000	0.000	0.000	0.000	0.000

Problem 649	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.014	3.768	1.316	0.000	0.000	0.000	0.000	0.000

Problem 650	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.015	3.087	0.961	0.000	0.000	0.000	0.000	0.000

Problem 651	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	74	0	0	142	0	0	-1
N.S.	1	1.00	1.06	0.00	0.00	2.03	0.00	0.00	-0.01
time (sec)	N/A	0.070	0.075	0.819	0.000	2.175	0.000	0.000	0.000

Problem 652	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	190	0	0	333	0	0	-1
N.S.	1	1.00	1.30	0.00	0.00	2.28	0.00	0.00	-0.01
time (sec)	N/A	0.107	0.156	0.837	0.000	1.719	0.000	0.000	0.000

Problem 653	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	188	0	0	660	0	0	-1
N.S.	1	1.00	0.83	0.00	0.00	2.92	0.00	0.00	-0.00
time (sec)	N/A	0.575	0.267	0.822	0.000	3.090	0.000	0.000	0.000

Problem 654	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	484	455	0	0	0	0	0	0	-1
N.S.	1	0.94	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.601	5.190	18.968	0.000	0.000	0.000	0.000	0.000

Problem 655	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	293	272	2792	0	0	0	0	0	-1
N.S.	1	0.93	9.53	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.306	5.564	8.006	0.000	0.000	0.000	0.000	0.000

Problem 656	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	148	508	0	0	0	0	0	-1
N.S.	1	0.92	3.16	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.134	1.397	3.323	0.000	0.000	0.000	0.000	0.000

Problem 657	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.043	7.178	1.845	0.000	0.000	0.000	0.000	0.000

Problem 658	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.041	9.672	0.879	0.000	0.000	0.000	0.000	0.000

Problem 659	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	569	569	445	1194	695	537	989	1242	-1
N.S.	1	1.00	0.78	2.10	1.22	0.94	1.74	2.18	-0.00
time (sec)	N/A	0.651	0.342	0.348	0.518	2.246	1.279	0.488	0.000

Problem 660	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	335	335	291	635	437	342	595	683	-1
N.S.	1	1.00	0.87	1.90	1.30	1.02	1.78	2.04	-0.00
time (sec)	N/A	0.385	0.237	0.147	0.537	2.298	0.705	0.429	0.000

Problem 661	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	166	276	225	183	279	285	-1
N.S.	1	1.00	1.06	1.77	1.44	1.17	1.79	1.83	-0.01
time (sec)	N/A	0.190	0.127	0.088	0.565	2.674	0.360	0.413	0.000

Problem 662	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	72	72	65	82	75	142
N.S.	1	1.00	1.00	1.53	1.53	1.38	1.74	1.60	3.02
time (sec)	N/A	0.045	0.031	0.066	0.468	2.826	0.098	0.426	0.533

Problem 663	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	821	821	1101	0	0	0	0	0	-1
N.S.	1	1.00	1.34	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.933	0.531	1.089	0.000	0.000	0.000	0.000	0.000

Problem 664	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.025	10.727	0.751	0.000	0.000	0.000	0.000	0.000

Problem 665	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.025	8.738	0.744	0.000	0.000	0.000	0.000	0.000

Problem 666	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.029	3.043	0.838	0.000	0.000	0.000	0.000	0.000

Problem 667	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.026	6.922	0.710	0.000	0.000	0.000	0.000	0.000

Problem 668	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	387	387	253	310	0	0	0	633	-1
N.S.	1	1.00	0.65	0.80	0.00	0.00	0.00	1.64	-0.00
time (sec)	N/A	0.528	0.384	0.179	0.000	0.000	0.000	0.468	0.000

Problem 669	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	125	142	0	0	0	229	-1
N.S.	1	1.00	0.70	0.79	0.00	0.00	0.00	1.28	-0.01
time (sec)	N/A	0.223	0.172	0.063	0.000	0.000	0.000	0.435	0.000

Problem 670	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	44	48	0	0	0	49	-1
N.S.	1	1.00	0.83	0.91	0.00	0.00	0.00	0.92	-0.02
time (sec)	N/A	0.046	0.021	0.063	0.000	0.000	0.000	0.412	0.000

Problem 671	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.024	0.502	0.947	0.000	0.000	0.000	0.000	0.000

Problem 672	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.023	2.313	3.223	0.000	0.000	0.000	0.000	0.000

Problem 673	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.028	0.799	0.408	0.000	0.000	0.000	0.000	0.000

Problem 674	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.030	0.793	0.424	0.000	0.000	0.000	0.000	0.000

Problem 675	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	1.100	0.395	0.000	0.000	0.000	0.000	0.000

Problem 676	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.033	2.691	0.422	0.000	0.000	0.000	0.000	0.000

Problem 677	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	498	498	359	795	0	0	0	2337	-1
N.S.	1	1.00	0.72	1.60	0.00	0.00	0.00	4.69	-0.00
time (sec)	N/A	0.513	1.300	0.427	0.000	0.000	0.000	0.486	0.000

Problem 678	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	249	249	191	367	0	0	0	891	-1
N.S.	1	1.00	0.77	1.47	0.00	0.00	0.00	3.58	-0.00
time (sec)	N/A	0.267	0.630	0.210	0.000	0.000	0.000	0.459	0.000

Problem 679	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	72	76	0	0	0	192	-1
N.S.	1	1.00	0.84	0.88	0.00	0.00	0.00	2.23	-0.01
time (sec)	N/A	0.110	0.124	0.067	0.000	0.000	0.000	0.438	0.000

Problem 680	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.024	13.724	1.105	0.000	0.000	0.000	0.000	0.000

Problem 681	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.022	35.858	3.622	0.000	0.000	0.000	0.000	0.000

Problem 682	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.028	4.908	0.417	0.000	0.000	0.000	0.000	0.000

Problem 683	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.029	8.504	0.434	0.000	0.000	0.000	0.000	0.000

Problem 684	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	18.605	0.412	0.000	0.000	0.000	0.000	0.000

Problem 685	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.031	35.552	0.408	0.000	0.000	0.000	0.000	0.000

Problem 686	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	754	754	400	1155	0	0	0	3216	-1
N.S.	1	1.00	0.53	1.53	0.00	0.00	0.00	4.27	-0.00
time (sec)	N/A	1.504	0.958	0.797	0.000	0.000	0.000	1.664	0.000

Problem 687	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	369	369	244	555	0	0	0	1661	-1
N.S.	1	1.00	0.66	1.50	0.00	0.00	0.00	4.50	-0.00
time (sec)	N/A	0.640	0.352	0.386	0.000	0.000	0.000	1.195	0.000

Problem 688	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	119	187	0	0	0	531	-1
N.S.	1	1.00	0.99	1.56	0.00	0.00	0.00	4.42	-0.01
time (sec)	N/A	0.162	0.073	0.015	0.000	0.000	0.000	0.624	0.000

Problem 689	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	6.585	0.793	0.000	0.000	0.000	0.000	0.000

Problem 690	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.031	13.555	1.592	0.000	0.000	0.000	0.000	0.000

Problem 691	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	482	482	873	850	0	0	0	2814	-1
N.S.	1	1.00	1.81	1.76	0.00	0.00	0.00	5.84	-0.00
time (sec)	N/A	0.948	8.703	0.472	0.000	0.000	0.000	1.757	0.000

Problem 692	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	291	278	0	0	0	993	-1
N.S.	1	1.00	1.83	1.75	0.00	0.00	0.00	6.25	-0.01
time (sec)	N/A	0.182	1.867	0.000	0.000	0.000	0.000	1.058	0.000

Problem 693	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.038	2.255	0.760	0.000	0.000	0.000	0.000	0.000

Problem 694	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	7.139	1.615	0.000	0.000	0.000	0.000	0.000

Problem 695	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	679	679	401	664	0	0	0	975	-1
N.S.	1	1.00	0.59	0.98	0.00	0.00	0.00	1.44	-0.00
time (sec)	N/A	0.982	0.989	0.572	0.000	0.000	0.000	0.838	0.000

Problem 696	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	246	310	0	0	0	481	-1
N.S.	1	1.00	0.75	0.94	0.00	0.00	0.00	1.46	-0.00
time (sec)	N/A	0.417	0.359	0.304	0.000	0.000	0.000	0.692	0.000

Problem 697	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	121	90	0	0	0	159	-1
N.S.	1	1.00	1.20	0.89	0.00	0.00	0.00	1.57	-0.01
time (sec)	N/A	0.069	0.067	0.040	0.000	0.000	0.000	0.459	0.000

Problem 698	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	0.099	0.783	0.000	0.000	0.000	0.000	0.000

Problem 699	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	0.057	1.411	0.000	0.000	0.000	0.000	0.000

Problem 700	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	394	394	417	460	0	0	0	0	-1
N.S.	1	1.00	1.06	1.17	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.506	0.699	0.406	0.000	0.000	0.000	0.000	0.000

Problem 701	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	167	158	0	0	0	0	-1
N.S.	1	1.00	1.22	1.15	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.163	0.213	0.125	0.000	0.000	0.000	0.000	0.000

Problem 702	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.042	0.114	0.759	0.000	0.000	0.000	0.000	0.000

Problem 703	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.039	0.060	1.559	0.000	0.000	0.000	0.000	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [441] had the largest ratio of [38]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	5	5	1.00	23	0.217
2	A	6	6	1.00	23	0.261
3	A	5	5	1.00	23	0.217
4	A	4	3	1.00	21	0.143
5	A	5	4	1.00	20	0.200
6	A	8	8	1.00	23	0.348
7	A	6	7	1.00	23	0.304
8	A	8	8	1.00	23	0.348
9	A	6	7	1.00	23	0.304
10	A	6	6	1.00	25	0.240
11	A	7	8	1.00	25	0.320
12	A	5	5	1.00	25	0.200
13	A	5	3	1.00	23	0.130
14	A	5	5	1.00	22	0.227
15	A	12	8	1.00	25	0.320
16	A	7	7	1.00	25	0.280
17	A	12	10	1.00	25	0.400
18	A	7	8	1.00	25	0.320
19	A	5	5	1.00	25	0.200
20	A	8	7	1.00	25	0.280
21	A	5	5	1.00	25	0.200
22	A	6	3	1.00	23	0.130
23	A	5	5	1.00	22	0.227
24	A	17	8	1.00	25	0.320
25	A	7	7	1.00	25	0.280

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
26	A	17	10	1.00	25	0.400
27	A	8	8	1.00	25	0.320
28	A	12	8	1.00	25	0.320
29	A	8	8	1.00	25	0.320
30	A	8	6	1.00	25	0.240
31	A	5	5	1.00	23	0.217
32	A	6	4	1.00	22	0.182
33	A	7	5	1.00	25	0.200
34	A	10	8	1.00	25	0.320
35	A	9	7	1.00	25	0.280
36	A	15	9	1.00	25	0.360
37	A	12	9	1.00	25	0.360
38	A	8	8	1.00	25	0.320
39	A	8	6	1.00	25	0.240
40	A	2	2	1.00	23	0.087
41	A	8	6	1.00	22	0.273
42	A	9	7	1.00	25	0.280
43	A	13	11	1.00	25	0.440
44	A	12	9	1.00	25	0.360
45	A	19	12	1.00	25	0.480
46	A	12	8	1.00	25	0.320
47	A	4	3	1.00	25	0.120
48	A	10	7	1.00	25	0.280
49	A	3	3	1.00	23	0.130
50	A	10	6	1.00	22	0.273
51	A	12	8	1.00	25	0.320
52	A	16	11	1.00	25	0.440
53	A	16	10	1.00	25	0.400
54	A	23	12	1.00	25	0.480
55	A	7	4	1.00	27	0.148
56	A	5	4	1.00	27	0.148
57	A	3	3	1.00	24	0.125
58	A	3	3	1.00	27	0.111
59	A	3	2	1.00	27	0.074
60	A	4	5	1.00	27	0.185

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
61	A	4	5	1.00	27	0.185
62	A	3	4	1.00	27	0.148
63	A	3	4	1.00	27	0.148
64	A	2	1	1.00	25	0.040
65	A	8	6	1.00	27	0.222
66	A	8	6	1.00	27	0.222
67	A	10	7	1.00	27	0.259
68	A	10	6	1.00	27	0.222
69	A	8	6	1.00	27	0.222
70	A	6	5	1.00	24	0.208
71	A	6	5	1.00	27	0.185
72	A	6	5	1.00	27	0.185
73	A	4	3	1.00	27	0.111
74	A	5	6	1.00	27	0.222
75	A	5	6	1.00	27	0.222
76	A	5	6	1.00	27	0.222
77	A	4	5	1.00	27	0.185
78	A	4	5	1.00	27	0.185
79	A	4	5	1.00	27	0.185
80	A	3	2	1.00	25	0.080
81	A	10	7	1.00	27	0.259
82	A	11	8	1.00	27	0.296
83	A	11	8	1.00	27	0.296
84	A	14	8	1.00	27	0.296
85	A	12	8	1.00	27	0.296
86	A	8	6	1.00	24	0.250
87	A	10	8	1.00	27	0.296
88	A	10	7	1.00	27	0.259
89	A	10	7	1.00	27	0.259
90	A	4	3	1.00	27	0.111
91	A	6	7	1.00	27	0.259
92	A	5	6	1.00	27	0.222
93	A	4	5	1.00	27	0.185
94	A	4	5	1.00	27	0.185
95	A	3	2	1.00	25	0.080

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
96	A	13	8	1.00	27	0.296
97	A	13	9	1.00	27	0.333
98	A	14	9	1.00	27	0.333
99	A	3	3	1.00	14	0.214
100	A	3	3	1.00	24	0.125
101	A	5	3	1.00	22	0.136
102	A	4	4	1.00	22	0.182
103	A	3	3	1.00	22	0.136
104	A	2	2	1.00	20	0.100
105	A	1	1	1.00	19	0.053
106	A	6	4	1.00	22	0.182
107	A	2	2	1.00	22	0.091
108	A	8	6	1.00	22	0.273
109	A	6	4	1.00	27	0.148
110	A	5	3	1.00	27	0.111
111	A	4	4	1.00	27	0.148
112	A	3	3	1.00	27	0.111
113	A	2	2	1.00	25	0.080
114	A	1	1	1.00	24	0.042
115	A	6	4	1.00	27	0.148
116	A	2	2	1.00	27	0.074
117	A	8	6	1.00	27	0.222
118	A	4	4	1.00	27	0.148
119	A	5	6	1.00	27	0.222
120	A	7	6	1.00	27	0.222
121	A	4	6	1.00	27	0.222
122	A	3	3	1.00	27	0.111
123	A	2	2	1.00	25	0.080
124	A	2	2	1.00	24	0.083
125	A	8	6	1.00	27	0.222
126	A	5	6	1.00	27	0.222
127	A	11	8	1.00	27	0.296
128	A	5	6	1.00	27	0.222
129	A	11	6	1.00	27	0.222
130	A	5	7	1.00	27	0.259

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
131	A	7	5	1.00	27	0.185
132	A	4	6	1.00	27	0.222
133	A	4	3	1.00	27	0.111
134	A	3	3	1.00	25	0.120
135	A	4	4	1.00	24	0.167
136	A	11	7	1.00	27	0.259
137	A	5	7	1.00	27	0.259
138	A	15	10	1.00	27	0.370
139	A	5	7	1.00	27	0.259
140	A	6	4	1.00	20	0.200
141	A	1	1	1.00	30	0.033
142	A	1	1	1.00	31	0.032
143	A	6	7	1.00	25	0.280
144	A	5	6	1.00	25	0.240
145	A	4	5	1.00	23	0.217
146	A	0	0	0.00	0	0.000
147	A	0	0	0.00	0	0.000
148	A	0	0	0.00	0	0.000
149	A	9	6	1.00	27	0.222
150	A	6	5	1.00	27	0.185
151	A	3	3	1.00	27	0.111
152	A	1	1	1.00	27	0.037
153	A	3	3	1.00	27	0.111
154	A	5	3	1.00	27	0.111
155	A	1	1	1.00	22	0.045
156	A	11	10	1.00	25	0.400
157	A	14	6	1.00	25	0.240
158	A	9	10	1.00	25	0.400
159	A	7	6	1.00	23	0.261
160	A	6	4	1.00	22	0.182
161	A	10	10	1.00	25	0.400
162	A	12	9	1.00	25	0.360
163	A	10	10	1.00	25	0.400
164	A	16	8	1.00	25	0.320
165	A	16	11	1.00	27	0.407

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
166	A	25	7	1.00	27	0.259
167	A	14	11	1.00	27	0.407
168	A	9	7	1.00	25	0.280
169	A	10	5	1.00	24	0.208
170	A	17	12	1.00	27	0.444
171	A	17	11	1.00	27	0.407
172	A	17	12	1.00	27	0.444
173	A	24	10	1.00	27	0.370
174	A	21	11	1.00	27	0.407
175	A	40	9	1.00	27	0.333
176	A	19	11	1.00	27	0.407
177	A	11	7	1.00	25	0.280
178	A	14	5	1.00	24	0.208
179	A	26	13	1.00	27	0.482
180	A	24	12	1.00	27	0.444
181	A	28	15	1.00	27	0.556
182	A	31	12	1.00	27	0.444
183	A	16	9	1.00	27	0.333
184	A	10	9	1.00	27	0.333
185	A	11	8	1.00	27	0.296
186	A	6	6	1.00	25	0.240
187	A	8	5	1.00	24	0.208
188	A	9	6	1.00	27	0.222
189	A	15	10	1.00	27	0.370
190	A	12	9	1.00	27	0.333
191	A	24	11	1.00	27	0.407
192	A	15	14	1.00	27	0.518
193	A	10	9	1.00	27	0.333
194	A	11	8	1.00	27	0.296
195	A	3	3	1.00	25	0.120
196	A	11	8	1.00	24	0.333
197	A	12	9	1.00	27	0.333
198	A	20	14	1.00	27	0.518
199	A	17	15	1.00	27	0.556
200	A	32	15	1.00	27	0.556

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
201	A	16	13	1.00	27	0.482
202	A	8	6	1.00	27	0.222
203	A	15	10	1.00	27	0.370
204	A	5	5	1.00	25	0.200
205	A	15	9	1.00	24	0.375
206	A	17	11	1.00	27	0.407
207	A	27	15	1.00	27	0.556
208	A	23	19	1.00	27	0.704
209	A	43	17	1.00	27	0.630
210	A	14	8	1.00	29	0.276
211	A	10	6	1.00	29	0.207
212	A	5	4	1.00	27	0.148
213	A	5	5	1.00	26	0.192
214	A	12	8	1.00	29	0.276
215	A	7	7	1.00	29	0.241
216	A	13	10	1.00	29	0.345
217	A	9	9	1.00	29	0.310
218	A	20	14	1.00	29	0.483
219	A	17	11	1.00	29	0.379
220	A	6	6	1.00	27	0.222
221	A	10	8	1.01	26	0.308
222	A	17	12	1.00	29	0.414
223	A	14	13	1.00	29	0.448
224	A	18	15	1.00	29	0.517
225	A	16	11	1.00	29	0.379
226	A	27	18	1.00	29	0.621
227	A	25	14	1.00	29	0.483
228	A	6	6	1.00	27	0.222
229	A	16	8	1.00	26	0.308
230	A	23	16	1.00	29	0.552
231	A	23	15	1.00	29	0.517
232	A	25	20	1.00	29	0.690
233	A	27	15	1.00	29	0.517
234	A	14	7	1.00	29	0.241
235	A	10	5	1.00	29	0.172

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
236	A	9	7	1.00	29	0.241
237	A	5	5	1.03	29	0.172
238	A	4	3	1.00	27	0.111
239	A	1	1	1.00	26	0.038
240	A	8	5	1.00	29	0.172
241	A	6	6	1.00	29	0.207
242	A	13	10	1.00	29	0.345
243	A	9	9	1.00	29	0.310
244	A	22	12	1.00	29	0.414
245	A	14	11	1.00	29	0.379
246	A	13	9	1.00	29	0.310
247	A	7	7	1.00	29	0.241
248	A	7	5	1.00	27	0.185
249	A	6	6	1.00	26	0.231
250	A	15	10	1.00	29	0.345
251	A	14	10	1.00	29	0.345
252	A	26	14	1.00	29	0.483
253	A	24	11	1.00	29	0.379
254	A	26	11	1.00	29	0.379
255	A	16	9	1.00	29	0.310
256	A	16	7	1.00	29	0.241
257	A	9	9	1.00	29	0.310
258	A	9	7	1.00	27	0.259
259	A	9	9	1.00	26	0.346
260	A	24	12	1.00	29	0.414
261	A	19	14	1.00	29	0.483
262	A	38	17	1.00	29	0.586
263	A	32	15	1.00	29	0.517
264	A	10	5	1.00	24	0.208
265	A	8	7	1.00	24	0.292
266	A	5	5	1.00	24	0.208
267	A	3	3	1.00	22	0.136
268	A	1	1	1.00	21	0.048
269	A	8	5	1.00	24	0.208
270	A	6	6	1.00	24	0.250

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
271	A	13	10	1.00	24	0.417
272	A	1	1	1.00	22	0.045
273	A	6	6	1.00	22	0.273
274	A	9	9	1.00	22	0.409
275	A	13	10	1.00	22	0.454
276	A	23	7	1.00	27	0.259
277	A	13	6	1.00	27	0.222
278	A	6	5	1.00	25	0.200
279	A	0	0	0.00	0	0.000
280	A	0	0	0.00	0	0.000
281	A	0	0	0.00	0	0.000
282	A	0	0	0.00	0	0.000
283	A	0	0	0.00	0	0.000
284	A	0	0	0.00	0	0.000
285	A	0	0	0.00	0	0.000
286	A	0	0	0.00	0	0.000
287	A	0	0	0.00	0	0.000
288	A	0	0	0.00	0	0.000
289	A	24	13	1.00	20	0.650
290	A	17	11	1.00	20	0.550
291	A	10	7	1.00	18	0.389
292	A	10	6	1.00	20	0.300
293	A	18	10	1.00	20	0.500
294	A	28	11	1.00	20	0.550
295	A	24	9	1.00	22	0.409
296	A	14	8	1.00	22	0.364
297	A	6	5	1.00	22	0.227
298	A	1	1	1.00	22	0.045
299	A	7	7	1.00	22	0.318
300	A	11	10	1.00	22	0.454
301	A	17	11	1.00	22	0.500
302	A	0	0	0.00	0	0.000
303	A	13	4	1.00	24	0.167
304	A	10	6	1.00	24	0.250
305	A	6	4	1.00	24	0.167

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
306	A	4	3	1.00	22	0.136
307	A	1	1	1.00	21	0.048
308	A	10	6	1.00	24	0.250
309	A	7	7	1.00	24	0.292
310	A	18	10	1.00	24	0.417
311	A	7	3	1.00	20	0.150
312	A	6	3	1.00	20	0.150
313	A	5	3	1.00	18	0.167
314	A	0	0	0.00	0	0.000
315	A	0	0	0.00	0	0.000
316	A	12	5	1.00	28	0.179
317	A	12	5	1.00	28	0.179
318	A	6	5	1.00	28	0.179
319	A	9	5	1.00	26	0.192
320	A	6	5	1.00	25	0.200
321	A	0	0	0.00	0	0.000
322	A	0	0	0.00	0	0.000
323	A	0	0	0.00	0	0.000
324	A	0	0	0.00	0	0.000
325	A	15	5	1.00	28	0.179
326	A	12	5	1.00	28	0.179
327	A	12	5	1.00	26	0.192
328	A	9	5	1.00	25	0.200
329	A	0	0	0.00	0	0.000
330	A	0	0	0.00	0	0.000
331	A	0	0	0.00	0	0.000
332	A	0	0	0.00	0	0.000
333	A	15	5	1.00	28	0.179
334	A	15	5	1.00	28	0.179
335	A	15	5	1.00	26	0.192
336	A	12	5	1.00	25	0.200
337	A	0	0	0.00	0	0.000
338	A	0	0	0.00	0	0.000
339	A	0	0	0.00	0	0.000
340	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
341	A	5	3	1.00	24	0.125
342	A	5	3	1.00	24	0.125
343	A	4	3	1.00	24	0.125
344	A	4	3	1.00	24	0.125
345	A	2	2	1.00	22	0.091
346	A	1	1	1.00	21	0.048
347	A	0	0	0.00	0	0.000
348	A	0	0	0.00	0	0.000
349	A	12	5	1.00	28	0.179
350	A	9	5	1.00	28	0.179
351	A	9	5	1.00	28	0.179
352	A	6	5	1.00	28	0.179
353	A	4	4	1.00	26	0.154
354	A	1	1	1.00	25	0.040
355	A	0	0	0.00	0	0.000
356	A	0	0	0.00	0	0.000
357	A	0	0	0.00	0	0.000
358	A	0	0	0.00	0	0.000
359	A	0	0	0.00	0	0.000
360	A	0	0	0.00	0	0.000
361	A	0	0	0.00	0	0.000
362	A	0	0	0.00	0	0.000
363	A	0	0	0.00	0	0.000
364	A	0	0	0.00	0	0.000
365	A	0	0	0.00	0	0.000
366	A	0	0	0.00	0	0.000
367	A	0	0	0.00	0	0.000
368	A	0	0	0.00	0	0.000
369	A	0	0	0.00	0	0.000
370	A	0	0	0.00	0	0.000
371	A	0	0	0.00	0	0.000
372	A	0	0	0.00	0	0.000
373	A	0	0	0.00	0	0.000
374	A	8	4	1.00	20	0.200
375	A	7	4	1.00	20	0.200

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
376	A	6	4	1.00	18	0.222
377	A	0	0	0.00	0	0.000
378	A	0	0	0.00	0	0.000
379	A	2	1	1.00	33	0.030
380	A	0	0	0.00	0	0.000
381	A	22	6	1.00	28	0.214
382	A	16	7	1.00	28	0.250
383	A	14	7	1.00	26	0.269
384	A	7	7	1.00	25	0.280
385	A	0	0	0.00	0	0.000
386	A	0	0	0.00	0	0.000
387	A	0	0	0.00	0	0.000
388	A	0	0	0.00	0	0.000
389	A	0	0	0.00	0	0.000
390	A	28	6	1.00	28	0.214
391	A	19	6	1.00	28	0.214
392	A	22	8	1.00	26	0.308
393	A	10	6	1.00	25	0.240
394	A	0	0	0.00	0	0.000
395	A	0	0	0.00	0	0.000
396	A	0	0	0.00	0	0.000
397	A	0	0	0.00	0	0.000
398	A	0	0	0.00	0	0.000
399	A	34	6	1.00	28	0.214
400	A	28	6	1.00	28	0.214
401	A	28	8	1.00	26	0.308
402	A	13	6	1.00	25	0.240
403	A	0	0	0.00	0	0.000
404	A	0	0	0.00	0	0.000
405	A	0	0	0.00	0	0.000
406	A	0	0	0.00	0	0.000
407	A	0	0	0.00	0	0.000
408	A	13	6	1.00	28	0.214
409	A	10	6	1.00	28	0.214
410	A	10	6	1.00	28	0.214

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
411	A	7	7	1.00	28	0.250
412	A	5	5	1.00	26	0.192
413	A	1	1	1.00	25	0.040
414	A	0	0	0.00	0	0.000
415	A	0	0	0.00	0	0.000
416	A	0	0	0.00	0	0.000
417	A	0	0	0.00	0	0.000
418	A	0	0	0.00	0	0.000
419	A	0	0	0.00	0	0.000
420	A	0	0	0.00	0	0.000
421	A	0	0	0.00	0	0.000
422	A	0	0	0.00	0	0.000
423	A	0	0	0.00	0	0.000
424	A	0	0	0.00	0	0.000
425	A	0	0	0.00	0	0.000
426	A	0	0	0.00	0	0.000
427	A	0	0	0.00	0	0.000
428	A	0	0	0.00	0	0.000
429	A	0	0	0.00	0	0.000
430	A	1	1	1.00	21	0.048
431	A	27	8	1.00	27	0.296
432	A	32	8	1.00	27	0.296
433	A	17	10	1.00	25	0.400
434	A	14	8	1.00	24	0.333
435	A	0	0	0.00	0	0.000
436	A	32	8	1.00	29	0.276
437	A	42	8	1.00	29	0.276
438	A	32	10	1.00	27	0.370
439	A	19	8	1.00	26	0.308
440	A	0	0	0.00	0	0.000
441	A	3	2	1.00	38	0.053
442	A	15	9	1.00	24	0.375
443	A	7	7	1.00	24	0.292
444	A	1	1	1.00	24	0.042
445	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
446	A	0	0	0.00	0	0.000
447	A	17	10	1.00	24	0.417
448	A	8	7	1.00	24	0.292
449	A	1	1	1.00	24	0.042
450	A	0	0	0.00	0	0.000
451	A	27	12	1.00	24	0.500
452	A	10	9	1.00	24	0.375
453	A	1	1	1.00	24	0.042
454	A	0	0	0.00	0	0.000
455	A	15	9	1.00	24	0.375
456	A	7	7	1.00	24	0.292
457	A	1	1	1.00	24	0.042
458	A	0	0	0.00	0	0.000
459	A	0	0	0.00	0	0.000
460	A	17	10	1.00	24	0.417
461	A	8	7	1.00	24	0.292
462	A	1	1	1.00	24	0.042
463	A	0	0	0.00	0	0.000
464	A	3	3	1.00	19	0.158
465	A	9	4	1.00	24	0.167
466	A	7	4	1.00	24	0.167
467	A	5	4	1.00	24	0.167
468	A	1	1	1.00	24	0.042
469	A	0	0	0.00	0	0.000
470	A	0	0	0.00	0	0.000
471	A	10	5	1.00	24	0.208
472	A	8	5	1.00	24	0.208
473	A	6	6	1.00	24	0.250
474	A	1	1	1.00	24	0.042
475	A	0	0	0.00	0	0.000
476	A	0	0	0.00	0	0.000
477	A	12	8	1.00	24	0.333
478	A	4	4	1.00	24	0.167
479	A	1	1	1.00	24	0.042
480	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
481	A	0	0	0.00	0	0.000
482	A	6	4	1.00	29	0.138
483	A	9	4	1.00	27	0.148
484	A	6	4	1.00	26	0.154
485	A	0	0	0.00	0	0.000
486	A	0	0	0.00	0	0.000
487	A	12	4	1.00	29	0.138
488	A	12	4	1.00	27	0.148
489	A	9	4	1.00	26	0.154
490	A	0	0	0.00	0	0.000
491	A	0	0	0.00	0	0.000
492	A	15	4	1.00	29	0.138
493	A	15	4	1.00	27	0.148
494	A	12	4	1.00	26	0.154
495	A	0	0	0.00	0	0.000
496	A	0	0	0.00	0	0.000
497	A	0	0	0.00	0	0.000
498	A	9	4	1.00	24	0.167
499	A	6	4	1.00	24	0.167
500	A	4	3	1.00	22	0.136
501	A	1	1	1.00	21	0.048
502	A	0	0	0.00	0	0.000
503	A	0	0	0.00	0	0.000
504	A	13	8	1.00	30	0.267
505	A	8	6	1.00	30	0.200
506	A	4	4	1.00	30	0.133
507	A	6	5	1.00	30	0.167
508	A	8	8	1.00	30	0.267
509	A	6	6	1.00	30	0.200
510	A	12	9	1.00	30	0.300
511	A	7	6	1.00	30	0.200
512	A	8	6	1.00	30	0.200
513	A	9	7	1.00	30	0.233
514	A	10	10	1.00	30	0.333
515	A	9	9	1.00	30	0.300

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
516	A	9	7	1.00	30	0.233
517	A	12	9	1.00	30	0.300
518	A	13	8	1.00	30	0.267
519	A	13	7	1.00	30	0.233
520	A	7	9	1.00	30	0.300
521	A	10	8	1.00	30	0.267
522	A	13	7	1.00	30	0.233
523	A	9	7	1.00	30	0.233
524	A	6	5	1.00	30	0.167
525	A	2	2	1.00	30	0.067
526	A	5	6	1.00	30	0.200
527	A	8	8	1.00	30	0.267
528	A	7	9	1.00	30	0.300
529	A	10	10	1.00	30	0.333
530	A	8	8	1.00	30	0.267
531	A	5	6	1.00	30	0.200
532	A	3	3	1.00	30	0.100
533	A	8	8	1.00	30	0.267
534	A	10	8	1.00	30	0.267
535	A	9	9	1.00	30	0.300
536	A	6	6	1.00	30	0.200
537	A	8	8	1.00	30	0.267
538	A	8	8	1.00	30	0.267
539	A	5	5	1.00	30	0.167
540	A	23	13	1.00	32	0.406
541	A	13	11	1.00	32	0.344
542	A	6	6	1.00	32	0.188
543	A	8	6	1.00	32	0.188
544	A	19	13	1.00	32	0.406
545	A	20	12	1.00	32	0.375
546	A	19	15	1.00	32	0.469
547	A	11	9	1.00	32	0.281
548	A	13	11	1.00	32	0.344
549	A	11	9	1.00	32	0.281
550	A	23	15	1.00	32	0.469

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
551	A	21	13	1.00	32	0.406
552	A	17	9	1.00	32	0.281
553	A	19	15	1.00	32	0.469
554	A	23	13	1.00	32	0.406
555	A	17	10	1.00	32	0.312
556	A	28	19	1.00	32	0.594
557	A	25	16	1.00	32	0.500
558	A	17	10	1.00	32	0.312
559	A	11	9	1.00	32	0.281
560	A	8	6	1.00	32	0.188
561	A	2	2	1.00	32	0.062
562	A	16	11	1.00	32	0.344
563	A	30	18	1.00	32	0.562
564	A	28	19	1.00	32	0.594
565	A	23	15	1.00	32	0.469
566	A	19	13	1.00	32	0.406
567	A	16	11	1.00	32	0.344
568	A	7	7	1.00	32	0.219
569	A	21	14	1.00	32	0.438
570	A	25	16	1.00	32	0.500
571	A	21	13	1.00	32	0.406
572	A	20	12	1.00	32	0.375
573	A	30	18	1.00	32	0.562
574	A	21	14	1.00	32	0.438
575	A	10	10	1.00	32	0.312
576	A	11	7	1.00	35	0.200
577	A	6	5	1.00	33	0.152
578	A	6	6	1.00	32	0.188
579	A	13	9	1.00	35	0.257
580	A	8	8	1.00	35	0.229
581	A	18	12	1.00	35	0.343
582	A	7	7	1.00	33	0.212
583	A	11	9	1.00	32	0.281
584	A	18	13	1.00	35	0.371
585	A	15	14	1.00	35	0.400

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
586	A	6	6	1.00	35	0.171
587	A	5	4	1.00	33	0.121
588	A	2	2	1.00	32	0.062
589	A	9	6	1.00	35	0.171
590	A	7	7	1.00	35	0.200
591	A	8	8	1.00	35	0.229
592	A	8	6	1.00	33	0.182
593	A	7	7	1.00	32	0.219
594	A	16	11	1.00	35	0.314
595	A	15	11	1.00	35	0.314
596	A	5	5	1.00	19	0.263
597	A	6	6	1.00	19	0.316
598	A	5	5	1.00	19	0.263
599	A	4	4	1.00	17	0.235
600	A	4	3	1.00	16	0.188
601	A	12	12	1.00	19	0.632
602	A	5	6	1.00	19	0.316
603	A	10	10	1.00	19	0.526
604	A	6	7	1.00	19	0.368
605	A	6	6	1.00	21	0.286
606	A	7	8	1.00	21	0.381
607	A	5	5	1.00	21	0.238
608	A	5	5	1.00	19	0.263
609	A	5	5	1.00	18	0.278
610	A	14	12	1.00	21	0.571
611	A	6	6	1.00	21	0.286
612	A	13	14	1.00	21	0.667
613	A	6	7	1.00	21	0.333
614	A	5	5	1.00	21	0.238
615	A	8	7	1.00	21	0.333
616	A	5	5	1.00	21	0.238
617	A	6	5	1.00	19	0.263
618	A	5	5	1.00	18	0.278
619	A	19	13	1.00	21	0.619
620	A	6	6	1.00	21	0.286

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
621	A	15	16	1.00	21	0.762
622	A	8	8	1.00	21	0.381
623	A	5	5	1.00	18	0.278
624	A	27	12	1.00	21	0.571
625	A	23	9	1.00	21	0.429
626	A	23	9	1.00	21	0.429
627	A	18	6	1.00	19	0.316
628	A	18	6	1.00	18	0.333
629	A	25	8	1.00	21	0.381
630	A	24	11	1.00	21	0.524
631	A	27	10	1.00	21	0.476
632	A	29	12	1.00	21	0.571
633	A	23	9	1.00	21	0.429
634	A	3	3	0.97	19	0.158
635	A	28	11	1.00	21	0.524
636	A	30	13	1.00	21	0.619
637	A	49	12	1.00	21	0.571
638	A	46	10	1.00	21	0.476
639	A	26	9	1.00	18	0.500
640	A	50	14	1.00	21	0.667
641	A	27	10	1.00	21	0.476
642	A	7	8	1.00	21	0.381
643	A	4	4	1.00	19	0.210
644	A	32	12	1.00	21	0.571
645	A	34	14	1.00	21	0.667
646	A	80	11	1.00	21	0.524
647	A	62	11	1.00	21	0.524
648	A	34	10	1.00	18	0.556
649	A	0	0	0.00	0	0.000
650	A	0	0	0.00	0	0.000
651	A	6	7	1.00	20	0.350
652	A	7	9	1.00	20	0.450
653	A	8	10	1.00	20	0.500
654	A	6	7	0.94	23	0.304
655	A	5	6	0.93	23	0.261

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
656	A	4	5	0.92	21	0.238
657	A	0	0	0.00	0	0.000
658	A	0	0	0.00	0	0.000
659	A	26	7	1.00	20	0.350
660	A	17	7	1.00	20	0.350
661	A	10	7	1.00	18	0.389
662	A	3	3	1.00	10	0.300
663	A	22	7	1.00	20	0.350
664	A	0	0	0.00	0	0.000
665	A	0	0	0.00	0	0.000
666	A	0	0	0.00	0	0.000
667	A	0	0	0.00	0	0.000
668	A	27	7	1.00	20	0.350
669	A	15	7	1.00	18	0.389
670	A	4	4	1.00	10	0.400
671	A	0	0	0.00	0	0.000
672	A	0	0	0.00	0	0.000
673	A	0	0	0.00	0	0.000
674	A	0	0	0.00	0	0.000
675	A	0	0	0.00	0	0.000
676	A	0	0	0.00	0	0.000
677	A	26	7	1.00	20	0.350
678	A	15	7	1.00	18	0.389
679	A	5	5	1.00	10	0.500
680	A	0	0	0.00	0	0.000
681	A	0	0	0.00	0	0.000
682	A	0	0	0.00	0	0.000
683	A	0	0	0.00	0	0.000
684	A	0	0	0.00	0	0.000
685	A	0	0	0.00	0	0.000
686	A	42	10	1.00	22	0.454
687	A	23	10	1.00	20	0.500
688	A	7	7	1.00	12	0.583
689	A	0	0	0.00	0	0.000
690	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
691	A	32	13	1.00	20	0.650
692	A	8	8	1.00	12	0.667
693	A	0	0	0.00	0	0.000
694	A	0	0	0.00	0	0.000
695	A	39	9	1.00	22	0.409
696	A	21	9	1.00	20	0.450
697	A	6	6	1.00	12	0.500
698	A	0	0	0.00	0	0.000
699	A	0	0	0.00	0	0.000
700	A	21	9	1.00	20	0.450
701	A	7	7	1.00	12	0.583
702	A	0	0	0.00	0	0.000
703	A	0	0	0.00	0	0.000

Chapter 3

Listing of integrals

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3.223 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{x^2}\,dx$ . . . 1262
3.224 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{x^3}\,dx$ . . . 1268
3.225 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{x^4}\,dx$ . . . 1276
3.226 $\int x^3(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2\,dx$ . . . 1283
3.227 $\int x^2(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2\,dx$ . . . 1291
3.228 $\int x(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2\,dx$ . . . 1298
3.229 $\int (d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2\,dx$ . . . 1304
3.230 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{x}\,dx$ . . . 1310
3.231 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{x^2}\,dx$ . . . 1318
3.232 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{x^3}\,dx$ . . . 1326
3.233 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{x^4}\,dx$ . . . 1335
3.234 $\int \frac{x^5(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$ . . . 1343
3.235 $\int \frac{x^4(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$ . . . 1349
3.236 $\int \frac{x^3(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$ . . . 1354
3.237 $\int \frac{x^2(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$ . . . 1359
3.238 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$ . . . 1363
3.239 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$ . . . 1367
3.240 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx$ . . . 1370
3.241 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx$ . . . 1374
3.242 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx$ . . . 1379
3.243 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx$ . . . 1385

3.244 $\int \frac{x^5(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$ 1391
3.245 $\int \frac{x^4(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$ 1398
3.246 $\int \frac{x^3(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$ 1404
3.247 $\int \frac{x^2(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$ 1410
3.248 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$ 1415
3.249 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$ 1419
3.250 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx$ 1423
3.251 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d-c^2dx^2)^{3/2}}\,dx$ 1429
3.252 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx$ 1434
3.253 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4(d-c^2dx^2)^{3/2}}\,dx$ 1441
3.254 $\int \frac{x^5(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$ 1448
3.255 $\int \frac{x^4(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$ 1455
3.256 $\int \frac{x^3(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$ 1461
3.257 $\int \frac{x^2(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$ 1466
3.258 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$ 1472
3.259 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$ 1477
3.260 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx$ 1483
3.261 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx$ 1490
3.262 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx$ 1498
3.263 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4(d-c^2dx^2)^{5/2}}\,dx$ 1506
3.264 $\int \frac{x^4\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$ 1513
3.265 $\int \frac{x^3\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$ 1517
3.266 $\int \frac{x^2\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$ 1522
3.267 $\int \frac{x\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$ 1526
3.268 $\int \frac{\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$ 1529
3.269 $\int \frac{\text{ArcSin}(ax)^2}{x\sqrt{1-a^2x^2}}\,dx$ 1532
3.270 $\int \frac{\text{ArcSin}(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx$ 1536

3.271 $\int \frac{\text{ArcSin}(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx$ 1540
3.272 $\int \frac{\text{ArcSin}(ax)^2}{\sqrt{c-a^2cx^2}}\,dx$ 1545
3.273 $\int \frac{\text{ArcSin}(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx$ 1548
3.274 $\int \frac{\text{ArcSin}(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx$ 1552
3.275 $\int \frac{\text{ArcSin}(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx$ 1557
3.276 $\int x^m(d-c^2dx^2)^3\,(a+b\text{ArcSin}(cx))^2\,dx$ 1562
3.277 $\int x^m(d-c^2dx^2)^2\,(a+b\text{ArcSin}(cx))^2\,dx$ 1568
3.278 $\int x^m(d-c^2dx^2)\,(a+b\text{ArcSin}(cx))^2\,dx$ 1573
3.279 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$ 1577
3.280 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$ 1580
3.281 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$ 1583
3.282 $\int x^m(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2\,dx$ 1587
3.283 $\int x^m(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2\,dx$ 1591
3.284 $\int x^m\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2\,dx$ 1594
3.285 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$ 1597
3.286 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$ 1600
3.287 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$ 1603
3.288 $\int \frac{x^m\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$ 1606
3.289 $\int (c-a^2cx^2)^3\,\text{ArcSin}(ax)^3\,dx$ 1609
3.290 $\int (c-a^2cx^2)^2\,\text{ArcSin}(ax)^3\,dx$ 1616
3.291 $\int (c-a^2cx^2)\,\text{ArcSin}(ax)^3\,dx$ 1621
3.292 $\int \frac{\text{ArcSin}(ax)^3}{c-a^2cx^2}\,dx$ 1626
3.293 $\int \frac{\text{ArcSin}(ax)^3}{(c-a^2cx^2)^2}\,dx$ 1630
3.294 $\int \frac{\text{ArcSin}(ax)^3}{(c-a^2cx^2)^3}\,dx$ 1635
3.295 $\int (c-a^2cx^2)^{5/2}\,\text{ArcSin}(ax)^3\,dx$ 1642
3.296 $\int (c-a^2cx^2)^{3/2}\,\text{ArcSin}(ax)^3\,dx$ 1647
3.297 $\int \sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^3\,dx$ 1652
3.298 $\int \frac{\text{ArcSin}(ax)^3}{\sqrt{c-a^2cx^2}}\,dx$ 1656
3.299 $\int \frac{\text{ArcSin}(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx$ 1659
3.300 $\int \frac{\text{ArcSin}(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx$ 1664
3.301 $\int \frac{\text{ArcSin}(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx$ 1669
3.302 $\int \frac{x^m\text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$ 1675

3.303 $\int \frac{x^4 \text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}} \, dx$ 1678
3.304 $\int \frac{x^3 \text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}} \, dx$ 1682
3.305 $\int \frac{x^2 \text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}} \, dx$ 1686
3.306 $\int \frac{x \text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}} \, dx$ 1690
3.307 $\int \frac{\text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}} \, dx$ 1694
3.308 $\int \frac{\text{ArcSin}(ax)^3}{x\sqrt{1-a^2x^2}} \, dx$ 1697
3.309 $\int \frac{\text{ArcSin}(ax)^3}{x^2\sqrt{1-a^2x^2}} \, dx$ 1701
3.310 $\int \frac{\text{ArcSin}(ax)^3}{x^3\sqrt{1-a^2x^2}} \, dx$ 1706
3.311 $\int \frac{(c-a^2cx^2)^3}{\text{ArcSin}(ax)} \, dx$ 1711
3.312 $\int \frac{(c-a^2cx^2)^2}{\text{ArcSin}(ax)} \, dx$ 1714
3.313 $\int \frac{c-a^2cx^2}{\text{ArcSin}(ax)} \, dx$ 1717
3.314 $\int \frac{1}{(c-a^2cx^2)\text{ArcSin}(ax)} \, dx$ 1720
3.315 $\int \frac{1}{(c-a^2cx^2)^2\text{ArcSin}(ax)} \, dx$ 1723
3.316 $\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)} \, dx$ 1726
3.317 $\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)} \, dx$ 1730
3.318 $\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)} \, dx$ 1734
3.319 $\int \frac{x\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)} \, dx$ 1738
3.320 $\int \frac{\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)} \, dx$ 1742
3.321 $\int \frac{\sqrt{1-c^2x^2}}{x(a+b\text{ArcSin}(cx))} \, dx$ 1746
3.322 $\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\text{ArcSin}(cx))} \, dx$ 1749
3.323 $\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))} \, dx$ 1752
3.324 $\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))} \, dx$ 1755
3.325 $\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)} \, dx$ 1758
3.326 $\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)} \, dx$ 1762
3.327 $\int \frac{x(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)} \, dx$ 1766
3.328 $\int \frac{(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)} \, dx$ 1770
3.329 $\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\text{ArcSin}(cx))} \, dx$ 1774

3.330 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\text{ArcSin}(cx))}\,dx$ 1778

3.331 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))}\,dx$ 1781

3.332 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\text{ArcSin}(cx))}\,dx$ 1784

3.333 $\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)}\,dx$ 1787

3.334 $\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)}\,dx$ 1791

3.335 $\int \frac{x(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)}\,dx$ 1796

3.336 $\int \frac{(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)}\,dx$ 1800

3.337 $\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\text{ArcSin}(cx))}\,dx$ 1804

3.338 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\text{ArcSin}(cx))}\,dx$ 1808

3.339 $\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\text{ArcSin}(cx))}\,dx$ 1811

3.340 $\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))}\,dx$ 1814

3.341 $\int \frac{x^4}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1817

3.342 $\int \frac{x^3}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1820

3.343 $\int \frac{x^2}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1823

3.344 $\int \frac{x^2}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1826

3.345 $\int \frac{x}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1829

3.346 $\int \frac{1}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1832

3.347 $\int \frac{1}{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1835

3.348 $\int \frac{1}{x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ 1838

3.349 $\int \frac{x^5}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1841

3.350 $\int \frac{x^4}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1845

3.351 $\int \frac{x^3}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1849

3.352 $\int \frac{x^2}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1853

3.353 $\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1857

3.354 $\int \frac{1}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1860

3.355 $\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1863

3.356 $\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ 1866

3.357 $\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$ 1869

3.358 $\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1872
3.359 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1875
3.360 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1878
3.361 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1881
3.362 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1884
3.363 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1887
3.364 $\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1890
3.365 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1893
3.366 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1896
3.367 $\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)}\,dx$ . . . 1899
3.368 $\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)}\,dx$ . . . 1902
3.369 $\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}\,dx$ . . . 1905
3.370 $\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$ . . . 1908
3.371 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1911
3.372 $\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$ . . . 1914
3.373 $\int \frac{x^m}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$ . . . 1917
3.374 $\int \frac{(c-a^2cx^2)^3}{\text{ArcSin}(ax)^2}\,dx$ . . . 1920
3.375 $\int \frac{(c-a^2cx^2)^2}{\text{ArcSin}(ax)^2}\,dx$ . . . 1924
3.376 $\int \frac{c-a^2cx^2}{\text{ArcSin}(ax)^2}\,dx$ . . . 1928
3.377 $\int \frac{1}{(c-a^2cx^2)\text{ArcSin}(ax)^2}\,dx$ . . . 1932
3.378 $\int \frac{1}{(c-a^2cx^2)^2\text{ArcSin}(ax)^2}\,dx$ . . . 1935
3.379 $\int \left(\frac{1}{(1-x^2)\text{ArcSin}(x)^2}-\frac{x}{(1-x^2)^{3/2}\text{ArcSin}(x)}\right)dx$ . . . 1938
3.380 $\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1941
3.381 $\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1944
3.382 $\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1949
3.383 $\int \frac{x\sqrt{1-c^2x^2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1954
3.384 $\int \frac{\sqrt{1-c^2x^2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1959
3.385 $\int \frac{\sqrt{1-c^2x^2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1963
3.386 $\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1966

3.387 $\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1969
3.388 $\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1972
3.389 $\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1975
3.390 $\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1978
3.391 $\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1984
3.392 $\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1990
3.393 $\int \frac{(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 1996
3.394 $\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2001
3.395 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2005
3.396 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2008
3.397 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2011
3.398 $\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2014
3.399 $\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2017
3.400 $\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2024
3.401 $\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2031
3.402 $\int \frac{(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2037
3.403 $\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2043
3.404 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2047
3.405 $\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2050
3.406 $\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2053
3.407 $\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2056
3.408 $\int \frac{x^5}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2059
3.409 $\int \frac{x^4}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2063
3.410 $\int \frac{x^3}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2068
3.411 $\int \frac{x^2}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2072
3.412 $\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2076
3.413 $\int \frac{1}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2080

3.414 $\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2083
3.415 $\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2086
3.416 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2089
3.417 $\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2092
3.418 $\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2095
3.419 $\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2098
3.420 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2101
3.421 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2104
3.422 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2107
3.423 $\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2110
3.424 $\int \frac{x^3}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2113
3.425 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2116
3.426 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2119
3.427 $\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2122
3.428 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2125
3.429 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$ . . . 2128
3.430 $\int \frac{1}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}\,dx$ . . . 2131
3.431 $\int \frac{x^3(d-c^2dx^2)}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2134
3.432 $\int \frac{x^2(d-c^2dx^2)}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2139
3.433 $\int \frac{x(d-c^2dx^2)}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2145
3.434 $\int \frac{d-c^2dx^2}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2151
3.435 $\int \frac{d-c^2dx^2}{x(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2156
3.436 $\int \frac{x^3(d-c^2dx^2)^2}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2160
3.437 $\int \frac{x^2(d-c^2dx^2)^2}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2167
3.438 $\int \frac{x(d-c^2dx^2)^2}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2174
3.439 $\int \frac{(d-c^2dx^2)^2}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2180
3.440 $\int \frac{(d-c^2dx^2)^2}{x(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ . . . 2185
3.441 $\int \left(-\frac{3x}{8(1-x^2)\sqrt{\text{ArcSin}(x)}}+\frac{x\text{ArcSin}(x)^{3/2}}{(1-x^2)^2}\right)dx$ . . . 2189
3.442 $\int (c-a^2cx^2)^{3/2}\sqrt{\text{ArcSin}(ax)}\,dx$ . . . 2193
3.443 $\int \sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(ax)}\,dx$ . . . 2198
3.444 $\int \frac{\sqrt{\text{ArcSin}(ax)}}{\sqrt{c-a^2cx^2}}\,dx$ . . . 2203

3.445 $\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$ 2206
3.446 $\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{5/2}}\,dx$ 2209
3.447 $\int (c-a^2cx^2)^{3/2}\,\text{ArcSin}(ax)^{3/2}\,dx$ 2212
3.448 $\int \sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}\,dx$ 2218
3.449 $\int \frac{\text{ArcSin}(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx$ 2223
3.450 $\int \frac{\text{ArcSin}(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx$ 2226
3.451 $\int (c-a^2cx^2)^{3/2}\,\text{ArcSin}(ax)^{5/2}\,dx$ 2229
3.452 $\int \sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{5/2}\,dx$ 2235
3.453 $\int \frac{\text{ArcSin}(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx$ 2240
3.454 $\int \frac{\text{ArcSin}(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx$ 2243
3.455 $\int (a^2-x^2)^{3/2}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}\,dx$ 2246
3.456 $\int \sqrt{a^2-x^2}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}\,dx$ 2252
3.457 $\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx$ 2257
3.458 $\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx$ 2260
3.459 $\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{(a^2-x^2)^{5/2}}\,dx$ 2263
3.460 $\int (a^2-x^2)^{3/2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}\,dx$ 2266
3.461 $\int \sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}\,dx$ 2272
3.462 $\int \frac{\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx$ 2277
3.463 $\int \frac{\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx$ 2280
3.464 $\int \frac{x}{\sqrt{1-x^2}\sqrt{\text{ArcSin}(x)}}\,dx$ 2283
3.465 $\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\text{ArcSin}(ax)}}\,dx$ 2286
3.466 $\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\text{ArcSin}(ax)}}\,dx$ 2290
3.467 $\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\text{ArcSin}(ax)}}\,dx$ 2294
3.468 $\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(ax)}}\,dx$ 2298
3.469 $\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\text{ArcSin}(ax)}}\,dx$ 2301
3.470 $\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\text{ArcSin}(ax)}}\,dx$ 2304

3.471 $\int \frac{(c-a^2cx^2)^{5/2}}{\text{ArcSin}(ax)^{3/2}}\,dx$ 2307

3.472 $\int \frac{(c-a^2cx^2)^{3/2}}{\text{ArcSin}(ax)^{3/2}}\,dx$ 2312

3.473 $\int \frac{\sqrt{c-a^2cx^2}}{\text{ArcSin}(ax)^{3/2}}\,dx$ 2317

3.474 $\int \frac{1}{\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}}\,dx$ 2322

3.475 $\int \frac{1}{(c-a^2cx^2)^{3/2}\,\text{ArcSin}(ax)^{3/2}}\,dx$ 2325

3.476 $\int \frac{1}{(c-a^2cx^2)^{5/2}\,\text{ArcSin}(ax)^{3/2}}\,dx$ 2328

3.477 $\int \frac{(c-a^2cx^2)^{3/2}}{\text{ArcSin}(ax)^{5/2}}\,dx$ 2331

3.478 $\int \frac{\sqrt{c-a^2cx^2}}{\text{ArcSin}(ax)^{5/2}}\,dx$ 2336

3.479 $\int \frac{1}{\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{5/2}}\,dx$ 2340

3.480 $\int \frac{1}{(c-a^2cx^2)^{3/2}\,\text{ArcSin}(ax)^{5/2}}\,dx$ 2343

3.481 $\int \frac{1}{(c-a^2cx^2)^{5/2}\,\text{ArcSin}(ax)^{5/2}}\,dx$ 2346

3.482 $\int x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2349

3.483 $\int x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2353

3.484 $\int \sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2357

3.485 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n}{x}\,dx$ 2361

3.486 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$ 2364

3.487 $\int x^2(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2367

3.488 $\int x(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2372

3.489 $\int (d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2377

3.490 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^n}{x}\,dx$ 2381

3.491 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$ 2384

3.492 $\int x^2(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2387

3.493 $\int x(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2392

3.494 $\int (d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^n\,dx$ 2397

3.495 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^n}{x}\,dx$ 2402

3.496 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$ 2405

3.497 $\int \frac{x^m\text{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$ 2408

3.498 $\int \frac{x^3\text{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$ 2411

3.499 $\int \frac{x^2\text{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$ 2415

3.500 $\int \frac{x\text{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$ 2419

3.501 $\int \frac{\text{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$ 2422

3.502 $\int \frac{\text{ArcSin}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$ . . . 2425
3.503 $\int \frac{\text{ArcSin}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$ . . . 2428
3.504 $\int (d+cdx)^{5/2}\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2431
3.505 $\int (d+cdx)^{3/2}\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2436
3.506 $\int \sqrt{d+cdx}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2441
3.507 $\int \frac{\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{\sqrt{d+cdx}}\,dx$ . . . 2445
3.508 $\int \frac{\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{(d+cdx)^{3/2}}\,dx$ . . . 2449
3.509 $\int \frac{\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{(d+cdx)^{5/2}}\,dx$ . . . 2454
3.510 $\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))\,dx$ . . . 2459
3.511 $\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))\,dx$ . . . 2464
3.512 $\int \sqrt{d+cdx}\,(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))\,dx$ . . . 2468
3.513 $\int \frac{(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{\sqrt{d+cdx}}\,dx$ . . . 2473
3.514 $\int \frac{(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{(d+cdx)^{3/2}}\,dx$ . . . 2478
3.515 $\int \frac{(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{(d+cdx)^{5/2}}\,dx$ . . . 2483
3.516 $\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))\,dx$ . . . 2488
3.517 $\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))\,dx$ . . . 2493
3.518 $\int \sqrt{d+cdx}\,(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))\,dx$ . . . 2498
3.519 $\int \frac{(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))}{\sqrt{d+cdx}}\,dx$ . . . 2503
3.520 $\int \frac{(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))}{(d+cdx)^{3/2}}\,dx$ . . . 2508
3.521 $\int \frac{(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))}{(d+cdx)^{5/2}}\,dx$ . . . 2513
3.522 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))}{\sqrt{f-cfx}}\,dx$ . . . 2518
3.523 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))}{\sqrt{f-cfx}}\,dx$ . . . 2523
3.524 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))}{\sqrt{f-cfx}}\,dx$ . . . 2528
3.525 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+cdx}\,\sqrt{f-cfx}}\,dx$ . . . 2532
3.526 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx$ . . . 2535
3.527 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx$ . . . 2539
3.528 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))}{(f-cfx)^{3/2}}\,dx$ . . . 2544
3.529 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))}{(f-cfx)^{3/2}}\,dx$ . . . 2549
3.530 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))}{(f-cfx)^{3/2}}\,dx$ . . . 2554
3.531 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+cdx}\,(f-cfx)^{3/2}}\,dx$ . . . 2559

3.532 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx$ 2563
3.533 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx$ 2566
3.534 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))}{(f-cfx)^{5/2}}\,dx$ 2571
3.535 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))}{(f-cfx)^{5/2}}\,dx$ 2576
3.536 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))}{(f-cfx)^{5/2}}\,dx$ 2581
3.537 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+cdx}\,(f-cfx)^{5/2}}\,dx$ 2586
3.538 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx$ 2591
3.539 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx$ 2596
3.540 $\int (d+cdx)^{5/2}\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2\,dx$ 2600
3.541 $\int (d+cdx)^{3/2}\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2\,dx$ 2606
3.542 $\int \sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2\,dx$ 2612
3.543 $\int \frac{\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}}\,dx$ 2616
3.544 $\int \frac{\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}}\,dx$ 2621
3.545 $\int \frac{\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}}\,dx$ 2627
3.546 $\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2\,dx$ 2633
3.547 $\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2\,dx$ 2640
3.548 $\int \sqrt{d+cdx}\,(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2\,dx$ 2645
3.549 $\int \frac{(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}}\,dx$ 2651
3.550 $\int \frac{(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}}\,dx$ 2656
3.551 $\int \frac{(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}}\,dx$ 2664
3.552 $\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2\,dx$ 2671
3.553 $\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2\,dx$ 2676
3.554 $\int \sqrt{d+cdx}\,(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2\,dx$ 2683
3.555 $\int \frac{(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}}\,dx$ 2689
3.556 $\int \frac{(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}}\,dx$ 2694
3.557 $\int \frac{(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}}\,dx$ 2703
3.558 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))^2}{\sqrt{e-cex}}\,dx$ 2711
3.559 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))^2}{\sqrt{e-cex}}\,dx$ 2716
3.560 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{e-cex}}\,dx$ 2721
3.561 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx$ 2726
3.562 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx$ 2729

3.563 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx$ . . . 2735
3.564 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))^2}{(e-cex)^{3/2}}\,dx$ . . . 2742
3.565 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))^2}{(e-cex)^{3/2}}\,dx$ . . . 2751
3.566 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))^2}{(e-cex)^{3/2}}\,dx$ . . . 2759
3.567 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,(e-cex)^{3/2}}\,dx$ . . . 2765
3.568 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$ . . . 2771
3.569 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx$ . . . 2776
3.570 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))^2}{(e-cex)^{5/2}}\,dx$ . . . 2783
3.571 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))^2}{(e-cex)^{5/2}}\,dx$ . . . 2791
3.572 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))^2}{(e-cex)^{5/2}}\,dx$ . . . 2798
3.573 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,(e-cex)^{5/2}}\,dx$ . . . 2804
3.574 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx$ . . . 2811
3.575 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx$ . . . 2818
3.576 $\int x^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2\,dx$ . . . 2824
3.577 $\int x\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2\,dx$ . . . 2829
3.578 $\int \sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2\,dx$ . . . 2833
3.579 $\int \frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{x}\,dx$ . . . 2837
3.580 $\int \frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{x^2}\,dx$ . . . 2842
3.581 $\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2\,dx$ . . . 2847
3.582 $\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2\,dx$ . . . 2853
3.583 $\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2\,dx$ . . . 2858
3.584 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{x}\,dx$ . . . 2863
3.585 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{x^2}\,dx$ . . . 2869
3.586 $\int \frac{x^2(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx$ . . . 2875
3.587 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx$ . . . 2880
3.588 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx$ . . . 2884
3.589 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx$ . . . 2887
3.590 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx$ . . . 2892
3.591 $\int \frac{x^2(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$ . . . 2897
3.592 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$ . . . 2902

3.593 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$ . . . 2907
3.594 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$ . . . 2912
3.595 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$ . . . 2918
3.596 $\int x^4(d+ex^2)\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2924
3.597 $\int x^3(d+ex^2)\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2928
3.598 $\int x^2(d+ex^2)\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2932
3.599 $\int x(d+ex^2)\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2936
3.600 $\int (d+ex^2)\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2940
3.601 $\int \frac{(d+ex^2)(a+b\text{ArcSin}(cx))}{x}\,dx$ . . . 2944
3.602 $\int \frac{(d+ex^2)(a+b\text{ArcSin}(cx))}{x^2}\,dx$ . . . 2949
3.603 $\int \frac{(d+ex^2)(a+b\text{ArcSin}(cx))}{x^3}\,dx$ . . . 2954
3.604 $\int \frac{(d+ex^2)(a+b\text{ArcSin}(cx))}{x^4}\,dx$ . . . 2959
3.605 $\int x^4(d+ex^2)^2\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2964
3.606 $\int x^3(d+ex^2)^2\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2969
3.607 $\int x^2(d+ex^2)^2\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2975
3.608 $\int x(d+ex^2)^2\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2980
3.609 $\int (d+ex^2)^2\,(a+b\text{ArcSin}(cx))\,dx$ . . . 2985
3.610 $\int \frac{(d+ex^2)^2(a+b\text{ArcSin}(cx))}{x}\,dx$ . . . 2989
3.611 $\int \frac{(d+ex^2)^2(a+b\text{ArcSin}(cx))}{x^2}\,dx$ . . . 2994
3.612 $\int \frac{(d+ex^2)^2(a+b\text{ArcSin}(cx))}{x^3}\,dx$ . . . 3000
3.613 $\int \frac{(d+ex^2)^2(a+b\text{ArcSin}(cx))}{x^4}\,dx$ . . . 3006
3.614 $\int x^4(d+ex^2)^3\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3013
3.615 $\int x^3(d+ex^2)^3\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3019
3.616 $\int x^2(d+ex^2)^3\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3025
3.617 $\int x(d+ex^2)^3\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3030
3.618 $\int (d+ex^2)^3\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3035
3.619 $\int \frac{(d+ex^2)^3(a+b\text{ArcSin}(cx))}{x}\,dx$ . . . 3040
3.620 $\int \frac{(d+ex^2)^3(a+b\text{ArcSin}(cx))}{x^2}\,dx$ . . . 3046
3.621 $\int \frac{(d+ex^2)^3(a+b\text{ArcSin}(cx))}{x^3}\,dx$ . . . 3052
3.622 $\int \frac{(d+ex^2)^3(a+b\text{ArcSin}(cx))}{x^4}\,dx$ . . . 3058
3.623 $\int (d+ex^2)^4\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3065
3.624 $\int \frac{x^4(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$ . . . 3070
3.625 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$ . . . 3076
3.626 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$ . . . 3083
3.627 $\int \frac{x(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$ . . . 3089
3.628 $\int \frac{a+b\text{ArcSin}(cx)}{d+ex^2}\,dx$ . . . 3095

3.629 $\int \frac{a+b\text{ArcSin}(cx)}{x(d+ex^2)}\,dx$ . . . 3100
3.630 $\int \frac{a+b\text{ArcSin}(cx)}{x^2(d+ex^2)}\,dx$ . . . 3105
3.631 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d+ex^2)}\,dx$ . . . 3111
3.632 $\int \frac{a+b\text{ArcSin}(cx)}{x^4(d+ex^2)}\,dx$ . . . 3117
3.633 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$ . . . 3123
3.634 $\int \frac{x(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$ . . . 3130
3.635 $\int \frac{a+b\text{ArcSin}(cx)}{x(d+ex^2)^2}\,dx$ . . . 3134
3.636 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d+ex^2)^2}\,dx$ . . . 3140
3.637 $\int \frac{x^4(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$ . . . 3146
3.638 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$ . . . 3154
3.639 $\int \frac{a+b\text{ArcSin}(cx)}{(d+ex^2)^2}\,dx$ . . . 3161
3.640 $\int \frac{a+b\text{ArcSin}(cx)}{x^2(d+ex^2)^2}\,dx$ . . . 3168
3.641 $\int \frac{x^5(a+b\text{ArcSin}(cx))}{(d+ex^2)^3}\,dx$ . . . 3176
3.642 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{(d+ex^2)^3}\,dx$ . . . 3182
3.643 $\int \frac{x(a+b\text{ArcSin}(cx))}{(d+ex^2)^3}\,dx$ . . . 3188
3.644 $\int \frac{a+b\text{ArcSin}(cx)}{x(d+ex^2)^3}\,dx$ . . . 3193
3.645 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d+ex^2)^3}\,dx$ . . . 3199
3.646 $\int \frac{x^4(a+b\text{ArcSin}(cx))}{(d+ex^2)^3}\,dx$ . . . 3207
3.647 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{(d+ex^2)^3}\,dx$ . . . 3216
3.648 $\int \frac{a+b\text{ArcSin}(cx)}{(d+ex^2)^3}\,dx$ . . . 3225
3.649 $\int \sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3233
3.650 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+ex^2}}\,dx$ . . . 3236
3.651 $\int \frac{a+b\text{ArcSin}(cx)}{(d+ex^2)^{3/2}}\,dx$ . . . 3239
3.652 $\int \frac{a+b\text{ArcSin}(cx)}{(d+ex^2)^{5/2}}\,dx$ . . . 3244
3.653 $\int \frac{a+b\text{ArcSin}(cx)}{(d+ex^2)^{7/2}}\,dx$ . . . 3249
3.654 $\int (fx)^m\,(d+ex^2)^3\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3254
3.655 $\int (fx)^m\,(d+ex^2)^2\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3259
3.656 $\int (fx)^m\,(d+ex^2)\,(a+b\text{ArcSin}(cx))\,dx$ . . . 3265
3.657 $\int \frac{(fx)^m(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$ . . . 3269
3.658 $\int \frac{(fx)^m(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$ . . . 3272

3.659 $\int (d+ex^2)^3 (a+b\text{ArcSin}(cx))^2 \, dx$ 3275
3.660 $\int (d+ex^2)^2 (a+b\text{ArcSin}(cx))^2 \, dx$ 3282
3.661 $\int (d+ex^2) (a+b\text{ArcSin}(cx))^2 \, dx$ 3288
3.662 $\int (a+b\text{ArcSin}(cx))^2 \, dx$ 3293
3.663 $\int \frac{(a+b\text{ArcSin}(cx))^2}{d+ex^2} \, dx$ 3297
3.664 $\int \sqrt{d+ex^2} (a+b\text{ArcSin}(cx))^2 \, dx$ 3303
3.665 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d+ex^2}} \, dx$ 3306
3.666 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{3/2}} \, dx$ 3309
3.667 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{5/2}} \, dx$ 3312
3.668 $\int \frac{(d+ex^2)^2}{a+b\text{ArcSin}(cx)} \, dx$ 3315
3.669 $\int \frac{d+ex^2}{a+b\text{ArcSin}(cx)} \, dx$ 3320
3.670 $\int \frac{1}{a+b\text{ArcSin}(cx)} \, dx$ 3325
3.671 $\int \frac{1}{(d+ex^2)(a+b\text{ArcSin}(cx))} \, dx$ 3328
3.672 $\int \frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))} \, dx$ 3331
3.673 $\int \frac{\sqrt{d+ex^2}}{a+b\text{ArcSin}(cx)} \, dx$ 3334
3.674 $\int \frac{1}{\sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))} \, dx$ 3337
3.675 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\text{ArcSin}(cx))} \, dx$ 3340
3.676 $\int \frac{1}{(d+ex^2)^{5/2}(a+b\text{ArcSin}(cx))} \, dx$ 3343
3.677 $\int \frac{(d+ex^2)^2}{(a+b\text{ArcSin}(cx))^2} \, dx$ 3346
3.678 $\int \frac{d+ex^2}{(a+b\text{ArcSin}(cx))^2} \, dx$ 3353
3.679 $\int \frac{1}{(a+b\text{ArcSin}(cx))^2} \, dx$ 3358
3.680 $\int \frac{1}{(d+ex^2)(a+b\text{ArcSin}(cx))^2} \, dx$ 3362
3.681 $\int \frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^2} \, dx$ 3365
3.682 $\int \frac{\sqrt{d+ex^2}}{(a+b\text{ArcSin}(cx))^2} \, dx$ 3368
3.683 $\int \frac{1}{\sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))^2} \, dx$ 3371
3.684 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\text{ArcSin}(cx))^2} \, dx$ 3374
3.685 $\int \frac{1}{(d+ex^2)^{5/2}(a+b\text{ArcSin}(cx))^2} \, dx$ 3377
3.686 $\int (d+ex^2)^2 \sqrt{a+b\text{ArcSin}(cx)} \, dx$ 3380
3.687 $\int (d+ex^2) \sqrt{a+b\text{ArcSin}(cx)} \, dx$ 3388
3.688 $\int \sqrt{a+b\text{ArcSin}(cx)} \, dx$ 3395
3.689 $\int \frac{\sqrt{a+b\text{ArcSin}(cx)}}{d+ex^2} \, dx$ 3400
3.690 $\int \frac{\sqrt{a+b\text{ArcSin}(cx)}}{(d+ex^2)^2} \, dx$ 3403
3.691 $\int (d+ex^2) (a+b\text{ArcSin}(cx))^{3/2} \, dx$ 3406

3.692 $\int (a+b\text{ArcSin}(cx))^{3/2}\,dx$ 3414
3.693 $\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{d+ex^2}\,dx$ 3420
3.694 $\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{(d+ex^2)^2}\,dx$ 3423
3.695 $\int \frac{(d+ex^2)^2}{\sqrt{a+b\text{ArcSin}(cx)}}\,dx$ 3426
3.696 $\int \frac{d+ex^2}{\sqrt{a+b\text{ArcSin}(cx)}}\,dx$ 3433
3.697 $\int \frac{1}{\sqrt{a+b\text{ArcSin}(cx)}}\,dx$ 3439
3.698 $\int \frac{1}{(d+ex^2)\sqrt{a+b\text{ArcSin}(cx)}}\,dx$ 3443
3.699 $\int \frac{1}{(d+ex^2)^2\sqrt{a+b\text{ArcSin}(cx)}}\,dx$ 3446
3.700 $\int \frac{d+ex^2}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ 3449
3.701 $\int \frac{1}{(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ 3454
3.702 $\int \frac{1}{(d+ex^2)(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ 3459
3.703 $\int \frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^{3/2}}\,dx$ 3462

3.1 $\int x^4(d - c^2dx^2)\,(a + b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=128

$$\frac{2bd\sqrt{1-c^2x^2}}{35c^5}+\frac{bd(1-c^2x^2)^{3/2}}{105c^5}-\frac{8bd(1-c^2x^2)^{5/2}}{175c^5}+\frac{bd(1-c^2x^2)^{7/2}}{49c^5}+\frac{1}{5}dx^5(a+b\text{ArcSin}(cx))-\frac{1}{7}c^2dx^7(a+b\text{ArcSin}(cx))$$

```
[Out] 1/105*b*d*(-c^2*x^2+1)^(3/2)/c^5-8/175*b*d*(-c^2*x^2+1)^(5/2)/c^5+1/49*b*d*
(-c^2*x^2+1)^(7/2)/c^5+1/5*d*x^5*(a+b*arcsin(c*x))-1/7*c^2*d*x^7*(a+b*arcsi
n(c*x))+2/35*b*d*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A]
time = 0.08, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {14, 4777, 12, 457, 78}

$$-\frac{1}{7}c^2dx^7(a+b\text{ArcSin}(cx))+\frac{1}{5}dx^5(a+b\text{ArcSin}(cx))+\frac{bd(1-c^2x^2)^{7/2}}{49c^5}-\frac{8bd(1-c^2x^2)^{5/2}}{175c^5}+\frac{bd(1-c^2x^2)^{3/2}}{105c^5}+\frac{2bd\sqrt{1-c^2x^2}}{35c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(35*c^5) + (b*d*(1 - c^2*x^2)^(3/2))/(105*c^5) -
(8*b*d*(1 - c^2*x^2)^(5/2))/(175*c^5) + (b*d*(1 - c^2*x^2)^(7/2))/(49*c^5)
+ (d*x^5*(a + b*ArcSin[c*x]))/5 - (c^2*d*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{dx^5(7-$$

$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{35}(bcd)\int\frac{x^5(7}{\sqrt{1}}$$

$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bcd)\text{Subst}\Bigg($$

$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{7}c^2dx^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bcd)\text{Subst}\Bigg($$

$$=\frac{2bd\sqrt{1-c^2x^2}}{35c^5}+\frac{bd(1-c^2x^2)^{3/2}}{105c^5}-\frac{8bd(1-c^2x^2)^{5/2}}{175c^5}+\frac{bd(1-c^2x^2}{49c^5}$$

Mathematica [A]
time = 0.09, size = 87, normalized size = 0.68

$$\frac{d\left(-105ax^5(-7+5c^2x^2)+\frac{b\sqrt{1-c^2x^2}\,(152+76c^2x^2+57c^4x^4-75c^6x^6)}{c^5}-105bx^5(-7+5c^2x^2)\,\text{ArcSin}(cx)\right)}{3675}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*(-105*a*x^5*(-7 + 5*c^2*x^2) + (b*Sqrt[1 - c^2*x^2]*(152 + 76*c^2*x^2 +
57*c^4*x^4 - 75*c^6*x^6))/c^5 - 105*b*x^5*(-7 + 5*c^2*x^2)*ArcSin[c*x]))/36
75
```

Maple [A]
time = 0.06, size = 130, normalized size = 1.02

method	result
derivativedivides	$\frac{-da\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-db\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{19c^4x^4\sqrt{-c^2x^2+1}}{1225}-\frac{76c^2x^2\sqrt{}}{}\right.}{c^5}$
default	$\frac{-da\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-db\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{19c^4x^4\sqrt{-c^2x^2+1}}{1225}-\frac{76c^2x^2\sqrt{}}{}\right.}{c^5}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-d*a*(1/7*c^7*x^7-1/5*c^5*x^5)-d*b*(1/7*arcsin(c*x)*c^7*x^7-1/5*arcs
in(c*x)*c^5*x^5+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-19/1225*c^4*x^4*(-c^2*x^2+1
)^(1/2)-76/3675*c^2*x^2*(-c^2*x^2+1)^(1/2)-152/3675*(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.48, size = 189, normalized size = 1.48

$$-\frac{1}{7}\,ac^2dx^7+\frac{1}{5}\,adx^5-\frac{1}{245}\left(35\,x^7\arcsin\left(cx\right)+\left(\frac{5\,\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\,\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\,\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bc^2d+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*a*c^2*d*x^7 + 1/5*a*d*x^5 - 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x
^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c
^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^2*d + 1/75*(15*x^5*arcsin(c*x) + (3*
sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2
 + 1)/c^6)*c)*b*d
```

Fricas [A]
time = 2.88, size = 101, normalized size = 0.79

$$-\frac{525\,ac^7dx^7-735\,ac^5dx^5+105\left(5\,bc^7dx^7-7\,bc^5dx^5\right)\arcsin\left(cx\right)+\left(75\,bc^6dx^6-57\,bc^4dx^4-76\,bc^2dx^2-152\,bd\right)\sqrt{-c^2x^2+1}}{3675\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*(525*a*c^7*d*x^7 - 735*a*c^5*d*x^5 + 105*(5*b*c^7*d*x^7 - 7*b*c^5*d
*x^5)*arcsin(c*x) + (75*b*c^6*d*x^6 - 57*b*c^4*d*x^4 - 76*b*c^2*d*x^2 - 152
*b*d)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 0.74, size = 151, normalized size = 1.18

$$\begin{cases} -\frac{ac^2dx^7}{7}+\frac{adx^5}{5}-\frac{bc^2dx^7\operatorname{asin}(cx)}{7}-\frac{bcdx^6\sqrt{-c^2x^2+1}}{49}+\frac{bdx^5\operatorname{asin}(cx)}{5}+\frac{19bdx^4\sqrt{-c^2x^2+1}}{1225c}+\frac{76bdx^2\sqrt{-c^2x^2+1}}{3675c^3}+\frac{152bd\sqrt{-c^2x^2+1}}{3675c^5} & \text{for}\ c\neq 0 \\ \frac{adx^5}{5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**7/7 + a*d*x**5/5 - b*c**2*d*x**7*asin(c*x)/7 - b*c*
d*x**6*sqrt(-c**2*x**2 + 1)/49 + b*d*x**5*asin(c*x)/5 + 19*b*d*x**4*sqrt(-c
**2*x**2 + 1)/(1225*c) + 76*b*d*x**2*sqrt(-c**2*x**2 + 1)/(3675*c**3) + 152
*b*d*sqrt(-c**2*x**2 + 1)/(3675*c**5), Ne(c, 0)), (a*d*x**5/5, True))
```

Giac [A]
time = 0.42, size = 195, normalized size = 1.52

$$-\frac{1}{7}\,ac^2dx^7+\frac{1}{5}\,adx^5-\frac{(c^2x^2-1)^3bdx\arcsin\left(cx\right)}{7\,c^4}-\frac{8\,(c^2x^2-1)^2bdx\arcsin\left(cx\right)}{35\,c^4}-\frac{(c^2x^2-1)bdx\arcsin\left(cx\right)}{35\,c^4}-\frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bd}{49\,c^5}+\frac{2\,bdx\arcsin\left(cx\right)}{35\,c^4}-\frac{8\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd}{175\,c^5}+\frac{(-c^2x^2+1)^{\frac{3}{2}}bd}{105\,c^5}+\frac{2\,\sqrt{-c^2x^2+1}\,bd}{35\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/7*a*c^2*d*x^7 + 1/5*a*d*x^5 - 1/7*(c^2*x^2 - 1)^3*b*d*x*arcsin(c*x)/c^4
- 8/35*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^4 - 1/35*(c^2*x^2 - 1)*b*d*x*arc
sin(c*x)/c^4 - 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 2/35*b*d*x
*arcsin(c*x)/c^4 - 8/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 1/105
*(-c^2*x^2 + 1)^(3/2)*b*d/c^5 + 2/35*sqrt(-c^2*x^2 + 1)*b*d/c^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
```

```
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.2 $\int x^3(d - c^2dx^2)(a + b\text{ArcSin}(cx))\,dx$

Optimal. Leaf size=123

$$\frac{bdx\sqrt{1-c^2x^2}}{24c^3}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}-\frac{bd\text{ArcSin}(cx)}{24c^4}+\frac{1}{4}dx^4(a+b\text{ArcSin}(cx))-\frac{1}{6}c^2dx^6(a+$$

```
[Out] -1/24*b*d*arcsin(c*x)/c^4+1/4*d*x^4*(a+b*arcsin(c*x))-1/6*c^2*d*x^6*(a+b*ar
csin(c*x))+1/24*b*d*x*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*d*x^3*(-c^2*x^2+1)^(1/2
)/c-1/36*b*c*d*x^5*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {14, 4777, 12, 470, 327, 222}

$$-\frac{1}{6}c^2dx^6(a+b\text{ArcSin}(cx))+\frac{1}{4}dx^4(a+b\text{ArcSin}(cx))-\frac{bd\text{ArcSin}(cx)}{24c^4}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}+\frac{bdx\sqrt{1-c^2x^2}}{24c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(24*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2])/(36*c) - (
b*c*d*x^5*Sqrt[1 - c^2*x^2])/36 - (b*d*ArcSin[c*x])/(24*c^4) + (d*x^4*(a +
b*ArcSin[c*x]))/4 - (c^2*d*x^6*(a + b*ArcSin[c*x]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
+ 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\int x^3\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx &= \frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}c^2dx^6\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{dx^4(3-\\
&= \frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}c^2dx^6\left(a+b\sin^{-1}(cx)\right)-\frac{1}{12}(bcd)\int\frac{x^4(3\\
&= -\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{6}c^2dx^6\left(a+b\sin^{-}\right.\\
&= \frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)-\\
&= \frac{bdx\sqrt{1-c^2x^2}}{24c^3}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{1}{4}dx^4(a\\
&= \frac{bdx\sqrt{1-c^2x^2}}{24c^3}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}-\frac{bd\sin^{-}}{24c}
\end{aligned}$$

Mathematica [A]
time = 0.07, size = 89, normalized size = 0.72

$$\frac{d\left(-6ac^4x^4(-3+2c^2x^2)+bcx\sqrt{1-c^2x^2}\,(3+2c^2x^2-2c^4x^4)-3b(1-6c^4x^4+4c^6x^6)\,\mathrm{ArcSin}(cx)\right)}{72c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*(-6*a*c^4*x^4*(-3 + 2*c^2*x^2) + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2
- 2*c^4*x^4) - 3*b*(1 - 6*c^4*x^4 + 4*c^6*x^6)*ArcSin[c*x]))/(72*c^4)
```

Maple [A]
time = 0.03, size = 118, normalized size = 0.96

method	result
derivativedivides	$\frac{-da\left(\frac{1}{6}c^{6}x^{6}-\frac{1}{4}c^{4}x^{4}\right)-db\left(\frac{\arcsin(cx)c^{6}x^{6}}{6}-\frac{c^{4}x^{4}\arcsin(cx)}{4}+\frac{c^{5}x^{5}\sqrt{-c^{2}x^{2}+1}}{36}-\frac{c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{36}-\frac{cx\sqrt{-c^{2}\cdots}}{2\cdots}\right.}{c^{4}}$
default	$\frac{-da\left(\frac{1}{6}c^{6}x^{6}-\frac{1}{4}c^{4}x^{4}\right)-db\left(\frac{\arcsin(cx)c^{6}x^{6}}{6}-\frac{c^{4}x^{4}\arcsin(cx)}{4}+\frac{c^{5}x^{5}\sqrt{-c^{2}x^{2}+1}}{36}-\frac{c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{36}-\frac{cx\sqrt{-c^{2}\cdots}}{2\cdots}\right.}{c^{4}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-d*a*(1/6*c^6*x^6-1/4*c^4*x^4)-d*b*(1/6*arcsin(c*x)*c^6*x^6-1/4*c^4*
x^4*arcsin(c*x)+1/36*c^5*x^5*(-c^2*x^2+1)^(1/2)-1/36*c^3*x^3*(-c^2*x^2+1)^(
1/2)-1/24*c*x*(-c^2*x^2+1)^(1/2)+1/24*arcsin(c*x)))
```

Maxima [A]
time = 0.49, size = 169, normalized size = 1.37

$$-\frac{1}{6}ac^{2}dx^{6}+\frac{1}{4}adx^{4}-\frac{1}{288}\left(48x^{6}\arcsin(cx)+\left(\frac{8\sqrt{-c^{2}x^{2}+1}x^{5}}{c^{2}}+\frac{10\sqrt{-c^{2}x^{2}+1}x^{3}}{c^{4}}+\frac{15\sqrt{-c^{2}x^{2}+1}x}{c^{6}}-\frac{15\arcsin(cx)}{c^{7}}\right)c\right)bc^{2}d+\frac{1}{32}\left(8x^{4}\arcsin(cx)+\left(\frac{2\sqrt{-c^{2}x^{2}+1}x^{3}}{c^{2}}+\frac{3\sqrt{-c^{2}x^{2}+1}x}{c^{4}}-\frac{3\arcsin(cx)}{c^{5}}\right)c\right)bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/6*a*c^2*d*x^6 + 1/4*a*d*x^4 - 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x
^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c
^6 - 15*arcsin(c*x)/c^7)*c)*b*c^2*d + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^
2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d
```

Fricas [A]
time = 2.24, size = 96, normalized size = 0.78

$$-\frac{12\,ac^{6}dx^{6}-18\,ac^{4}dx^{4}+3\,(4\,bc^{6}dx^{6}-6\,bc^{4}dx^{4}+bd)\arcsin(cx)+(2\,bc^{5}dx^{5}-2\,bc^{3}dx^{3}-3\,bcdx)\sqrt{-c^{2}x^{2}+1}}{72\,c^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/72*(12*a*c^6*d*x^6 - 18*a*c^4*d*x^4 + 3*(4*b*c^6*d*x^6 - 6*b*c^4*d*x^4 +
 b*d)*arcsin(c*x) + (2*b*c^5*d*x^5 - 2*b*c^3*d*x^3 - 3*b*c*d*x)*sqrt(-c^2*x
^2 + 1))/c^4
```

Sympy [A]
time = 0.53, size = 138, normalized size = 1.12

$$\begin{cases} -\frac{ac^2dx^6}{6} + \frac{adx^4}{4} - \frac{bc^2dx^6\operatorname{asin}(cx)}{6} - \frac{bcdx^5\sqrt{-c^2x^2+1}}{36} + \frac{bdx^4\operatorname{asin}(cx)}{4} + \frac{bdx^3\sqrt{-c^2x^2+1}}{36c} + \frac{bdx\sqrt{-c^2x^2+1}}{24c^3} - \frac{bd\operatorname{asin}(cx)}{24c^4} & \text{for } c \neq 0 \\ \frac{adx^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**6/6 + a*d*x**4/4 - b*c**2*d*x**6*asin(c*x)/6 - b*c*
d*x**5*sqrt(-c**2*x**2 + 1)/36 + b*d*x**4*asin(c*x)/4 + b*d*x**3*sqrt(-c**2
*x**2 + 1)/(36*c) + b*d*x*sqrt(-c**2*x**2 + 1)/(24*c**3) - b*d*asin(c*x)/(2
4*c**4), Ne(c, 0)), (a*d*x**4/4, True))
```

Giac [A]
time = 0.40, size = 144, normalized size = 1.17

$$-\frac{1}{6}ac^2dx^6 + \frac{1}{4}adx^4 - \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bdx}{36\,c^3} - \frac{(c^2x^2-1)^3bd\arcsin(cx)}{6\,c^4} + \frac{(-c^2x^2+1)^{\frac{3}{2}}bdx}{36\,c^3} - \frac{(c^2x^2-1)^2bd\arcsin(cx)}{4\,c^4} + \frac{\sqrt{-c^2x^2+1}\,bdx}{24\,c^3} + \frac{bd\arcsin(cx)}{24\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/6*a*c^2*d*x^6 + 1/4*a*d*x^4 - 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*
d*x/c^3 - 1/6*(c^2*x^2 - 1)^3*b*d*arcsin(c*x)/c^4 + 1/36*(-c^2*x^2 + 1)^(3/
2)*b*d*x/c^3 - 1/4*(c^2*x^2 - 1)^2*b*d*arcsin(c*x)/c^4 + 1/24*sqrt(-c^2*x^2
 + 1)*b*d*x/c^3 + 1/24*b*d*arcsin(c*x)/c^4
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,(a+b\,\operatorname{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.3 $\int x^2(d - c^2dx^2)\,(a + b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=105

$$\frac{2bd\sqrt{1-c^2x^2}}{15c^3}+\frac{bd(1-c^2x^2)^{3/2}}{45c^3}-\frac{bd(1-c^2x^2)^{5/2}}{25c^3}+\frac{1}{3}dx^3(a+b\text{ArcSin}(cx))-\frac{1}{5}c^2dx^5(a+b\text{ArcSin}(cx))$$

```
[Out] 1/45*b*d*(-c^2*x^2+1)^(3/2)/c^3-1/25*b*d*(-c^2*x^2+1)^(5/2)/c^3+1/3*d*x^3*(
a+b*arcsin(c*x))-1/5*c^2*d*x^5*(a+b*arcsin(c*x))+2/15*b*d*(-c^2*x^2+1)^(1/2
)/c^3
```

Rubi [A]
time = 0.07, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {14, 4777, 12, 457, 78}

$$-\frac{1}{5}c^2dx^5(a+b\text{ArcSin}(cx))+\frac{1}{3}dx^3(a+b\text{ArcSin}(cx))-\frac{bd(1-c^2x^2)^{5/2}}{25c^3}+\frac{bd(1-c^2x^2)^{3/2}}{45c^3}+\frac{2bd\sqrt{1-c^2x^2}}{15c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(15*c^3) + (b*d*(1 - c^2*x^2)^(3/2))/(45*c^3) - (
b*d*(1 - c^2*x^2)^(5/2))/(25*c^3) + (d*x^3*(a + b*ArcSin[c*x]))/3 - (c^2*d*
x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int x^2\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{5}c^2dx^5\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{dx^3(5-\\ &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{5}c^2dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{15}(bcd)\int\frac{x^3(5\\ &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{5}c^2dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bcd)\text{Subst}\Big(\\ &= \frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{5}c^2dx^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bcd)\text{Subst}\Big(\\ &= \frac{2bd\sqrt{1-c^2x^2}}{15c^3}+\frac{bd(1-c^2x^2)^{3/2}}{45c^3}-\frac{bd(1-c^2x^2)^{5/2}}{25c^3}+\frac{1}{3}dx^3\left(a+b\,\text{s}\right.\end{aligned}$$

Mathematica [A]
time = 0.07, size = 85, normalized size = 0.81

$$\frac{d\left(b\sqrt{1-c^2x^2}\,(26+13c^2x^2-9c^4x^4)+a(75c^3x^3-45c^5x^5)+15bc^3x^3(5-3c^2x^2)\,\text{ArcSin}(cx)\right)}{225c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*(b*Sqrt[1 - c^2*x^2]*(26 + 13*c^2*x^2 - 9*c^4*x^4) + a*(75*c^3*x^3 - 45*
c^5*x^5) + 15*b*c^3*x^3*(5 - 3*c^2*x^2)*ArcSin[c*x]))/(225*c^3)
```

Maple [A]
time = 0.03, size = 110, normalized size = 1.05

method	result
derivativedivides	$\frac{-da\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-db\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{13c^2x^2\sqrt{-c^2x^2+1}}{225}-\frac{26\sqrt{-c^2x^2+1}}{225}\right)}{c^3}$
default	$\frac{-da\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-db\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{13c^2x^2\sqrt{-c^2x^2+1}}{225}-\frac{26\sqrt{-c^2x^2+1}}{225}\right)}{c^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-d*a*(1/5*c^5*x^5-1/3*c^3*x^3)-d*b*(1/5*arcsin(c*x)*c^5*x^5-1/3*c^3*
x^3*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-13/225*c^2*x^2*(-c^2*x^2+1)
^(1/2)-26/225*(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.48, size = 148, normalized size = 1.41

$$-\frac{1}{5}ac^2dx^5-\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^2d+\frac{1}{3}adx^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/5*a*c^2*d*x^5 - 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^2*d + 1/
3*a*d*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt
(-c^2*x^2 + 1)/c^4))*b*d
```

Fricas [A]
time = 2.47, size = 91, normalized size = 0.87

$$-\frac{45\,ac^5dx^5-75\,ac^3dx^3+15\,(3\,bc^5dx^5-5\,bc^3dx^3)\arcsin(cx)+(9\,bc^4dx^4-13\,bc^2dx^2-26\,bd)\sqrt{-c^2x^2+1}}{225\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/225*(45*a*c^5*d*x^5 - 75*a*c^3*d*x^3 + 15*(3*b*c^5*d*x^5 - 5*b*c^3*d*x^3
)*arcsin(c*x) + (9*b*c^4*d*x^4 - 13*b*c^2*d*x^2 - 26*b*d)*sqrt(-c^2*x^2 + 1
))/c^3
```

Sympy [A]
time = 0.34, size = 126, normalized size = 1.20

$$\begin{cases} -\frac{ac^2dx^5}{5}+\frac{adx^3}{3}-\frac{bc^2dx^5\operatorname{asin}(cx)}{5}-\frac{bcdx^4\sqrt{-c^2x^2+1}}{25}+\frac{bdx^3\operatorname{asin}(cx)}{3}+\frac{13bdx^2\sqrt{-c^2x^2+1}}{225c}+\frac{26bd\sqrt{-c^2x^2+1}}{225c^3} & \text{for}\ c\neq 0\\ \frac{adx^3}{3} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**5/5 + a*d*x**3/3 - b*c**2*d*x**5*asin(c*x)/5 - b*c*
d*x**4*sqrt(-c**2*x**2 + 1)/25 + b*d*x**3*asin(c*x)/3 + 13*b*d*x**2*sqrt(-c
**2*x**2 + 1)/(225*c) + 26*b*d*sqrt(-c**2*x**2 + 1)/(225*c**3), Ne(c, 0)),
(a*d*x**3/3, True))
```

Giac [A]
time = 0.40, size = 142, normalized size = 1.35

$$-\frac{1}{5}\,ac^2dx^5+\frac{1}{3}\,adx^3-\frac{(c^2x^2-1)^2bdx\arcsin\left(cx\right)}{5\,c^2}-\frac{(c^2x^2-1)bdx\arcsin\left(cx\right)}{15\,c^2}+\frac{2\,bdx\arcsin\left(cx\right)}{15\,c^2}-\frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd}{25\,c^3}+\frac{(-c^2x^2+1)^{\frac{3}{2}}bd}{45\,c^3}+\frac{2\,\sqrt{-c^2x^2+1}\,bd}{15\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/5*a*c^2*d*x^5 + 1/3*a*d*x^3 - 1/5*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^2
- 1/15*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^2 + 2/15*b*d*x*arcsin(c*x)/c^2 - 1
/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^3 + 1/45*(-c^2*x^2 + 1)^(3/2)*
b*d/c^3 + 2/15*sqrt(-c^2*x^2 + 1)*b*d/c^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.4 $\int x(d - c^2dx^2)\left(a + b\mathbf{ArcSin}(cx)\right)dx$

Optimal. Leaf size=90

$$\frac{3bdx\sqrt{1-c^2x^2}}{32c} + \frac{bdx(1-c^2x^2)^{3/2}}{16c} + \frac{3bd\text{ArcSin}(cx)}{32c^2} - \frac{d(1-c^2x^2)^2\left(a+b\text{ArcSin}(cx)\right)}{4c^2}$$

```
[Out] 1/16*b*d*x*(-c^2*x^2+1)^(3/2)/c+3/32*b*d*arcsin(c*x)/c^2-1/4*d*(-c^2*x^2+1)
^2*(a+b*arcsin(c*x))/c^2+3/32*b*d*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.03, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {4767, 201, 222}

$$-\frac{d(1-c^2x^2)^2\left(a+b\text{ArcSin}(cx)\right)}{4c^2} + \frac{3bd\text{ArcSin}(cx)}{32c^2} + \frac{bdx(1-c^2x^2)^{3/2}}{16c} + \frac{3bdx\sqrt{1-c^2x^2}}{32c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*x*Sqrt[1 - c^2*x^2])/(32*c) + (b*d*x*(1 - c^2*x^2)^(3/2))/(16*c) + (
3*b*d*ArcSin[c*x])/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(4*c^
2)
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x(d-c^2dx^2)\,(a+b\sin^{-1}(cx))\;dx = -\frac{d(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))}{4c^2}+\frac{(bd)\int(1-c^2x^2)^{3/2}\;dx}{4c}$$
$$=\frac{bdx(1-c^2x^2)^{3/2}}{16c}-\frac{d(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))}{4c^2}+\frac{(3bd)\int\sqrt{1-c^2}}{16c}$$
$$=\frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{bdx(1-c^2x^2)^{3/2}}{16c}-\frac{d(1-c^2x^2)^2\,(a+b\sin^{-1}(cx)}{4c^2}$$
$$=\frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{bdx(1-c^2x^2)^{3/2}}{16c}+\frac{3bd\sin^{-1}(cx)}{32c^2}-\frac{d(1-c^2x^2)^2}{}$$

Mathematica [**A**]
time = 0.06, size = 77, normalized size = 0.86

$$-\frac{d\Big(cx\Big(8acx(-2+c^2x^2)+b\sqrt{1-c^2x^2}\,(-5+2c^2x^2)\Big)+b(5-16c^2x^2+8c^4x^4)\,\text{ArcSin}(cx)\Big)}{32c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/32*(d*(c*x*(8*a*c*x*(-2 + c^2*x^2) + b*Sqrt[1 - c^2*x^2]*(-5 + 2*c^2*x^2
)) + b*(5 - 16*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]))/c^2
```

Maple [**A**]
time = 0.06, size = 92, normalized size = 1.02

method	result	si
derivativedivides	$\frac{-\frac{d(c^2x^2-1)^2a}{4}-db\left(\frac{c^4x^4\arcsin(cx)}{4}-\frac{c^2x^2\arcsin(cx)}{2}+\frac{5\arcsin(cx)}{32}+\frac{c^3x^3\sqrt{-c^2x^2+1}}{16}-\frac{5cx\sqrt{-c^2x^2+1}}{32}\right)}{c^2}$	92
default	$\frac{-\frac{d(c^2x^2-1)^2a}{4}-db\left(\frac{c^4x^4\arcsin(cx)}{4}-\frac{c^2x^2\arcsin(cx)}{2}+\frac{5\arcsin(cx)}{32}+\frac{c^3x^3\sqrt{-c^2x^2+1}}{16}-\frac{5cx\sqrt{-c^2x^2+1}}{32}\right)}{c^2}$	92

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/4*d*(c^2*x^2-1)^2*a-d*b*(1/4*c^4*x^4*arcsin(c*x)-1/2*c^2*x^2*arcs
in(c*x)+5/32*arcsin(c*x)+1/16*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/32*c*x*(-c^2*x^2
+1)^(1/2)))
```

Maxima [A]
time = 0.48, size = 128, normalized size = 1.42

$$-\frac{1}{4}ac^2dx^4-\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}\,x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}\,x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)bc^2d+\frac{1}{2}adx^2+\frac{1}{4}\left(2x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/4*a*c^2*d*x^4 - 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2
+ 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*c^2*d + 1/2*a*d*x^2
+ 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*
b*d
```

Fricas [A]
time = 2.46, size = 86, normalized size = 0.96

$$-\frac{8\,ac^4dx^4-16\,ac^2dx^2+\left(8\,bc^4dx^4-16\,bc^2dx^2+5\,bd\right)\arcsin(cx)+\left(2\,bc^3dx^3-5\,bcdx\right)\sqrt{-c^2x^2+1}}{32\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/32*(8*a*c^4*d*x^4 - 16*a*c^2*d*x^2 + (8*b*c^4*d*x^4 - 16*b*c^2*d*x^2 + 5
*b*d)*arcsin(c*x) + (2*b*c^3*d*x^3 - 5*b*c*d*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A]
time = 0.26, size = 117, normalized size = 1.30

$$\begin{cases}-\frac{ac^2dx^4}{4}+\frac{adx^2}{2}-\frac{bc^2dx^4\operatorname{asin}(cx)}{4}-\frac{bcdx^3\sqrt{-c^2x^2+1}}{16}+\frac{bdx^2\operatorname{asin}(cx)}{2}+\frac{5bdx\sqrt{-c^2x^2+1}}{32c}-\frac{5bd\operatorname{asin}(cx)}{32c^2} & \text{for}\ c\neq 0\\ \frac{adx^2}{2} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**4/4 + a*d*x**2/2 - b*c**2*d*x**4*asin(c*x)/4 - b*c*
d*x**3*sqrt(-c**2*x**2 + 1)/16 + b*d*x**2*asin(c*x)/2 + 5*b*d*x*sqrt(-c**2*
x**2 + 1)/(32*c) - 5*b*d*asin(c*x)/(32*c**2), Ne(c, 0)), (a*d*x**2/2, True)
)
```

Giac [A]
time = 0.43, size = 100, normalized size = 1.11

$$-\frac{1}{4}ac^2dx^4+\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bdx}{16\,c}-\frac{\left(c^2x^2-1\right)^2bd\arcsin(cx)}{4\,c^2}+\frac{3\sqrt{-c^2x^2+1}\,bdx}{32\,c}+\frac{\left(c^2x^2-1\right)ad}{2\,c^2}+\frac{3\,bd\arcsin(cx)}{32\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/4*a*c^2*d*x^4 + 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*x/c - 1/4*(c^2*x^2 - 1)^2*
b*d*arcsin(c*x)/c^2 + 3/32*sqrt(-c^2*x^2 + 1)*b*d*x/c + 1/2*(c^2*x^2 - 1)*a
*d/c^2 + 3/32*b*d*arcsin(c*x)/c^2
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.5 $\int (d - c^2dx^2)(a + b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=77

$$\frac{2bd\sqrt{1-c^2x^2}}{3c}+\frac{bd(1-c^2x^2)^{3/2}}{9c}+dx(a+b\text{ArcSin}(cx))-\frac{1}{3}c^2dx^3(a+b\text{ArcSin}(cx))$$

```
[Out] 1/9*b*d*(-c^2*x^2+1)^(3/2)/c+d*x*(a+b*arcsin(c*x))-1/3*c^2*d*x^3*(a+b*arcsi
n(c*x))+2/3*b*d*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.04, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4739, 12, 455, 45}

$$-\frac{1}{3}c^2dx^3(a+b\text{ArcSin}(cx))+dx(a+b\text{ArcSin}(cx))+\frac{bd(1-c^2x^2)^{3/2}}{9c}+\frac{2bd\sqrt{1-c^2x^2}}{3c}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(3*c) + (b*d*(1 - c^2*x^2)^(3/2))/(9*c) + d*x*(a
+ b*ArcSin[c*x]) - (c^2*d*x^3*(a + b*ArcSin[c*x]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
```

```
Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx = dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-(bc)\int \frac{dx\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}$$
$$= dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-(bcd)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}$$
$$= dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bcd)\text{Subst}\left(\int \frac{1}{\sqrt{1}}\right.$$
$$= dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bcd)\text{Subst}\left(\int \left(\frac{}{3}\right.\right.$$
$$= \frac{2bd\sqrt{1-c^2x^2}}{3c}+\frac{bd\left(1-c^2x^2\right)^{3/2}}{9c}+dx\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2dx^3\left(a-\right.$$

Mathematica [A]
time = 0.06, size = 88, normalized size = 1.14

$$adx-\frac{1}{3}ac^2dx^3+\frac{7bd\sqrt{1-c^2x^2}}{9c}-\frac{1}{9}bcdx^2\sqrt{1-c^2x^2}+bdx\text{ArcSin}(cx)-\frac{1}{3}bc^2dx^3\text{ArcSin}(cx)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
[Out] a*d*x - (a*c^2*d*x^3)/3 + (7*b*d*Sqrt[1 - c^2*x^2])/(9*c) - (b*c*d*x^2*Sqrt
[1 - c^2*x^2])/9 + b*d*x*ArcSin[c*x] - (b*c^2*d*x^3*ArcSin[c*x])/3
```

Maple [A]
time = 0.00, size = 82, normalized size = 1.06

method	result	size
derivativedivides	$\frac{-da\left(\frac{1}{3}c^3x^3-cx\right)-db\left(\frac{c^3x^3\arcsin(cx)}{3}-cx\arcsin(cx)+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}-\frac{7\sqrt{-c^2x^2+1}}{9}\right)}{c}$	82
default	$\frac{-da\left(\frac{1}{3}c^3x^3-cx\right)-db\left(\frac{c^3x^3\arcsin(cx)}{3}-cx\arcsin(cx)+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}-\frac{7\sqrt{-c^2x^2+1}}{9}\right)}{c}$	82

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-d*a*(1/3*c^3*x^3-c*x)-d*b*(1/3*c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)+1/
9*c^2*x^2*(-c^2*x^2+1)^(1/2)-7/9*(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.49, size = 97, normalized size = 1.26

$$-\frac{1}{3}\,ac^2dx^3-\frac{1}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^2d+adx+\frac{\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bd}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/3*a*c^2*d*x^3 - 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d + a*d*x + (c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*b*d/c
```

Fricas [A]
time = 2.29, size = 71, normalized size = 0.92

$$-\frac{3\,ac^3dx^3-9\,acdx+3\left(bc^3dx^3-3\,bcdx\right)\arcsin\left(cx\right)+\left(bc^2dx^2-7\,bd\right)\sqrt{-c^2x^2+1}}{9\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/9*(3*a*c^3*d*x^3 - 9*a*c*d*x + 3*(b*c^3*d*x^3 - 3*b*c*d*x)*arcsin(c*x) +
 (b*c^2*d*x^2 - 7*b*d)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A]
time = 0.14, size = 90, normalized size = 1.17

$$\begin{cases}-\frac{ac^2dx^3}{3}+adx-\frac{bc^2dx^3\operatorname{asin}\left(cx\right)}{3}-\frac{bcdx^2\sqrt{-c^2x^2+1}}{9}+bdx\operatorname{asin}\left(cx\right)+\frac{7bd\sqrt{-c^2x^2+1}}{9c} & \text{for}\ c\neq 0\\ adx & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**3/3 + a*d*x - b*c**2*d*x**3*asin(c*x)/3 - b*c*d*x**
2*sqrt(-c**2*x**2 + 1)/9 + b*d*x*asin(c*x) + 7*b*d*sqrt(-c**2*x**2 + 1)/(9*
c), Ne(c, 0)), (a*d*x, True))
```

Giac [A]
time = 0.41, size = 80, normalized size = 1.04

$$-\frac{1}{3}\,ac^2dx^3-\frac{1}{3}\left(c^2x^2-1\right)bdx\arcsin\left(cx\right)+\frac{2}{3}\,bdx\arcsin\left(cx\right)+adx+\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bd}{9\,c}+\frac{2\,\sqrt{-c^2x^2+1}\,bd}{3\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/3*a*c^2*d*x^3 - 1/3*(c^2*x^2 - 1)*b*d*x*arcsin(c*x) + 2/3*b*d*x*arcsin(c
*x) + a*d*x + 1/9*(-c^2*x^2 + 1)^(3/2)*b*d/c + 2/3*sqrt(-c^2*x^2 + 1)*b*d/c
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\begin{cases} \frac{b\,d\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c}-b\,c^2\,d\,\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}(c\,x)}{3}\right)-\frac{a\,d\,x\,\left(c^2\,x^2-3\right)}{3} & \text{if }\ 0<c\\ \int (a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)\,dx & \text{if }\ \neg 0<c \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2),x)
```

```
[Out] piecewise(0 < c, - b*c^2*d*(((1/c^2 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*as
in(c*x))/3) + (b*d*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c - (a*d*x*(c^2
*x^2 - 3))/3, ~0 < c, int((a + b*asin(c*x))*(d - c^2*d*x^2), x))
```

3.6 $\int \frac{(d-c^2dx^2)(a+b\mathbf{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=121

$$-\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\text{ArcSin}(cx)+\frac{1}{2}d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))-\frac{id(a+b\text{ArcSin}(cx))^2}{2b}+d(a+b\text{ArcSin}$$

```
[Out] -1/4*b*d*arcsin(c*x)+1/2*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))-1/2*I*d*(a+b*arcs
in(c*x))^2/b+d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*b
*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/4*b*c*d*x*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {4773, 4721, 3798, 2221, 2317, 2438, 201, 222}

$$\frac{1}{2}d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))-\frac{id(a+b\text{ArcSin}(cx))^2}{2b}+d\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{1}{2}ibd\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{4}bd\text{ArcSin}(cx)-\frac{1}{4}bcdx\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/4*(b*c*d*x*Sqrt[1 - c^2*x^2]) - (b*d*ArcSin[c*x])/4 + (d*(1 - c^2*x^2)*(
a + b*ArcSin[c*x]))/2 - ((I/2)*d*(a + b*ArcSin[c*x])^2)/b + d*(a + b*ArcSin
[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d*PolyLog[2, E^((2*I)*ArcSi
n[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)\,(a+b\sin^{-1}(cx))}{x}\,dx = \frac{1}{2}d\big(1-c^2x^2\big)\,\big(a+b\sin^{-1}(cx)\big)+d\int \frac{a+b\sin^{-1}(cx)}{x}\,dx-\frac{1}{2}(bcd)\int$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}+\frac{1}{2}d\big(1-c^2x^2\big)\,\big(a+b\sin^{-1}(cx)\big)+d\text{Subst}\bigg(\int (a$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\big(1-c^2x^2\big)\,\big(a+b\sin^{-1}(cx)\big)$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\big(1-c^2x^2\big)\,\big(a+b\sin^{-1}(cx)\big)$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\big(1-c^2x^2\big)\,\big(a+b\sin^{-1}(cx)\big)$$

$$= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\sin^{-1}(cx)+\frac{1}{2}d\big(1-c^2x^2\big)\,\big(a+b\sin^{-1}(cx)\big)$$

Mathematica [A]
time = 0.06, size = 115, normalized size = 0.95

$$-\frac{1}{2}ac^2dx^2-\frac{1}{4}bcdx\sqrt{1-c^2x^2}+\frac{1}{4}bd\text{ArcSin}(cx)-\frac{1}{2}bc^2dx^2\text{ArcSin}(cx)+bd\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+ad\log(x)-\frac{1}{2}ibd\big(\text{ArcSin}(cx)^2+\text{PolyLog}\big(2,e^{2i\text{ArcSin}(cx)}\big)\big)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/2*(a*c^2*d*x^2) - (b*c*d*x*Sqrt[1 - c^2*x^2])/4 + (b*d*ArcSin[c*x])/4 -
(b*c^2*d*x^2*ArcSin[c*x])/2 + b*d*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])
] + a*d*Log[x] - (I/2)*b*d*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x]
)])
```

Maple [A]
time = 0.21, size = 164, normalized size = 1.36

method	result
derivativedivides	$-\frac{da\,c^2x^2}{2}+da\ln(cx)-\frac{ibd\arcsin(cx)^2}{2}+db\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+db\,\mathrm{ar}$
default	$-\frac{da\,c^2x^2}{2}+da\ln(cx)-\frac{ibd\arcsin(cx)^2}{2}+db\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+db\,\mathrm{ar}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*d*a*c^2*x^2+d*a*ln(c*x)-1/2*I*b*d*arcsin(c*x)^2+d*b*arcsin(c*x)*ln(1+I
*c*x+(-c^2*x^2+1)^(1/2))+d*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*d
```

```
*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d*b*polylog(2,I*c*x+(-c^2*x^2+1)^
(1/2))+1/4*d*b*arcsin(c*x)*cos(2*arcsin(c*x))-1/8*d*b*sin(2*arcsin(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] -1/2*a*c^2*d*x^2 + a*d*log(x) - integrate((b*c^2*d*x^2 - b*d)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{a}{x}\right)dx+\int ac^2x\,dx+\int\left(-\frac{b\,\mathrm{asin}\,(cx)}{x}\right)dx+\int bc^2x\,\mathrm{asin}\,(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x,x)
```

```
[Out] -d*(Integral(-a/x, x) + Integral(a*c**2*x, x) + Integral(-b*asin(c*x)/x, x)
 + Integral(b*c**2*x*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x, x)
```

3.7 $\int \frac{(d-c^2dx^2)(a+b\textbf{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=69

$$-bcd\sqrt{1-c^2x^2}-\frac{d(a+b\text{ArcSin}(cx))}{x}-c^2dx(a+b\text{ArcSin}(cx))-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -d*(a+b*arcsin(c*x))/x-c^2*d*x*(a+b*arcsin(c*x))-b*c*d*arctanh((-c^2*x^2+1)
^(1/2))-b*c*d*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {14, 4777, 12, 457, 81, 65, 214}

$$c^2(-d)x(a+b\text{ArcSin}(cx))-\frac{d(a+b\text{ArcSin}(cx))}{x}-bcd\sqrt{1-c^2x^2}-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2]) - (d*(a + b*ArcSin[c*x]))/x - c^2*d*x*(a + b*Arc
Sin[c*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 81

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[b*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/(d*f*(n + p +
```

```
 2))), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))}{x^2}\,dx = -\frac{d(a+b\sin^{-1}(cx))}{x} - c^2dx\big(a+b\sin^{-1}(cx)\big) - (bc)\int \frac{d(-1-c^2x^2)}{x\sqrt{1-c^2x^2}}$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{x} - c^2dx\big(a+b\sin^{-1}(cx)\big) - (bcd)\int \frac{-1-c^2x^2}{x\sqrt{1-c^2x^2}}$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{x} - c^2dx\big(a+b\sin^{-1}(cx)\big) - \frac{1}{2}(bcd)\text{Subst}\bigg(\int \frac{-1}{x\sqrt{1}}$$

$$= -bcd\sqrt{1-c^2x^2} - \frac{d(a+b\sin^{-1}(cx))}{x} - c^2dx\big(a+b\sin^{-1}(cx)\big) + \frac{1}{2}(b$$

$$= -bcd\sqrt{1-c^2x^2} - \frac{d(a+b\sin^{-1}(cx))}{x} - c^2dx\big(a+b\sin^{-1}(cx)\big) - \frac{(bd)}{}$$

$$= -bcd\sqrt{1-c^2x^2} - \frac{d(a+b\sin^{-1}(cx))}{x} - c^2dx\big(a+b\sin^{-1}(cx)\big) - bcd$$

Mathematica [A]

time = 0.02, size = 78, normalized size = 1.13

$$-\frac{ad}{x}-ac^2dx-bcd\sqrt{1-c^2x^2}-\frac{bd\mathrm{ArcSin}(cx)}{x}-bc^2dx\mathrm{ArcSin}(cx)-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*d)/x) - a*c^2*d*x - b*c*d*Sqrt[1 - c^2*x^2] - (b*d*ArcSin[c*x])/x - b*
c^2*d*x*ArcSin[c*x] - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A]
time = 0.01, size = 67, normalized size = 0.97

method	result
derivativedivides	$c\left(-da\left(cx+\frac{1}{cx}\right)-db\left(cx\arcsin\left(cx\right)+\frac{\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}+\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+}}\right.\right.\right.$
default	$c\left(-da\left(cx+\frac{1}{cx}\right)-db\left(cx\arcsin\left(cx\right)+\frac{\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}+\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+}}\right.\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-d*a*(c*x+1/c/x)-d*b*(c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/
2)+arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.48, size = 82, normalized size = 1.19

$$-ac^2dx-\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bcd-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin\left(cx\right)}{x}\right)bd-\frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -a*c^2*d*x - (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*c*d - (c*log(2*sqrt(-
c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d - a*d/x
```

Fricas [A]
time = 2.13, size = 98, normalized size = 1.42

$$-\frac{2\,ac^2dx^2+bcdx\log\left(\sqrt{-c^2x^2+1}+1\right)-bcdx\log\left(\sqrt{-c^2x^2+1}-1\right)+2\sqrt{-c^2x^2+1}\,bcdx+2\,ad+2\,(bc^2dx^2+bd)\arcsin\left(cx\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a*c^2*d*x^2 + b*c*d*x*log(sqrt(-c^2*x^2 + 1) + 1) - b*c*d*x*log(sqr
t(-c^2*x^2 + 1) - 1) + 2*sqrt(-c^2*x^2 + 1)*b*c*d*x + 2*a*d + 2*(b*c^2*d*x^
2 + b*d)*arcsin(c*x))/x
```

Sympy [**A**]
time = 2.65, size = 82, normalized size = 1.19

$$-ac^2dx - \frac{ad}{x} - bc^2d\left(\begin{cases} 0 & \text{for}\ c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + bcd\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bd\operatorname{asin}(cx)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*c**2*d*x - a*d/x - b*c**2*d*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt
(-c**2*x**2 + 1)/c, True)) + b*c*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x
**2) > 1), (I*asin(1/(c*x)), True)) - b*d*asin(c*x)/x
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 856 vs. 2(65) = 130.
time = 1.23, size = 856, normalized size = 12.41

$$-\frac{bc^5dx^4\arcsin(cx)}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^4} - \frac{ac^5dx^4}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^4} + \frac{bc^4dx^3\log(|c||x|)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^3} - \frac{bc^4dx^3\log\left(\sqrt{-c^2x^2+1}+1\right)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^3} + \frac{bc^4dx^3}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^3} - \frac{3bc^3dx^2\arcsin(cx)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^2} - \frac{3ac^3dx^2}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^2} + \frac{bc^2dx\log(|c||x|)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{bc^2dx\log\left(\sqrt{-c^2x^2+1}+1\right)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{bc^2dx}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{bcd\arcsin(cx)}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)} - \frac{acd}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^5*d*x^4*arcsin(c*x)/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sq
rt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/2*a*c^5*d*x^4/((c^3*
x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x
^2 + 1) + 1)^4) + b*c^4*d*x^3*log(abs(c)*abs(x))/((c^3*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - b*
c^4*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
+ c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) + b*c^4*d*x^3/(
(c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-
c^2*x^2 + 1) + 1)^3) - 3*b*c^3*d*x^2*arcsin(c*x)/((c^3*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 3*
a*c^3*d*x^2/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^2*d*x*log(abs(c)*abs(x))/((c^3*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)) - b*c^2*d*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^3*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c
^2*d*x/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d*arcsin(c*x)/(c^3*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*a*c*d/(c^3*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
```

Mupad [B]
time = 0.23, size = 71, normalized size = 1.03

$$-\frac{a\,d\,\left(c^2\,x^2+1\right)}{x}-b\,c\,d\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}\left(c\,x\right)\right)-\frac{b\,d\,\mathrm{asin}\left(c\,x\right)}{x}-b\,c\,d\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^2,x)
```

```
[Out] - (a*d*(c^2*x^2 + 1))/x - b*c*d*((1 - c^2*x^2)^(1/2) + c*x*asin(c*x)) - (b*
d*asin(c*x))/x - b*c*d*atanh(1/(1 - c^2*x^2)^(1/2))
```

3.8 $\int \frac{(d-c^2dx^2)(a+b\mathbf{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=139

$$-\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}bc^2d\text{ArcSin}(cx)-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{2x^2}+\frac{ic^2d(a+b\text{ArcSin}(cx))^2}{2b}-c^2d(a+b\text{Arc}$$

```
[Out] -1/2*b*c^2*d*arcsin(c*x)-1/2*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))/x^2+1/2*I*c^2
*d*(a+b*arcsin(c*x))^2/b-c^2*d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(
1/2))^2)+1/2*I*b*c^2*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d*(-
c^2*x^2+1)^(1/2)/x
```

Rubi [A]
time = 0.09, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {4775, 283, 222, 4721, 3798, 2221, 2317, 2438}

$$-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{2x^2}+\frac{ic^2d(a+b\text{ArcSin}(cx))^2}{2b}-c^2d\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))+\frac{1}{2}ibc^2d\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{2}bc^2d\text{ArcSin}(cx)-\frac{bcd\sqrt{1-c^2x^2}}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d*Sqrt[1 - c^2*x^2])/x - (b*c^2*d*ArcSin[c*x])/2 - (d*(1 - c^2*x^
2)*(a + b*ArcSin[c*x]))/(2*x^2) + ((I/2)*c^2*d*(a + b*ArcSin[c*x])^2)/b - c
^2*d*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] + (I/2)*b*c^2*d*Pol
yLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)\,(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{2x^2} + \frac{1}{2}(bcd)\int \frac{\sqrt{1-c^2x^2}}{x^2}\,dx - (c^2d)\int$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{2x^2} - (c^2d)\,\text{Subst}\bigg(\int (a$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}bc^2d\sin^{-1}(cx) - \frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{2x^2} +$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}bc^2d\sin^{-1}(cx) - \frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{2x^2} +$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}bc^2d\sin^{-1}(cx) - \frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{2x^2} +$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}bc^2d\sin^{-1}(cx) - \frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{2x^2} +$$

Mathematica [A]
time = 0.05, size = 112, normalized size = 0.81

$$-\frac{ad}{2x^2} - \frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{bd\text{ArcSin}(cx)}{2x^2} - bc^2d\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right) - ac^2d\log(x) + \frac{1}{2}ibc^2d\left(\text{ArcSin}(cx)^2 + \text{PolyLog}\left(2, e^{2i\text{ArcSin}(cx)}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(a*d)/x^2 - (b*c*d*Sqrt[1 - c^2*x^2])/(2*x) - (b*d*ArcSin[c*x])/(2*x^2
) - b*c^2*d*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - a*c^2*d*Log[x] + (
I/2)*b*c^2*d*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])])
```

Maple [A]
time = 0.29, size = 186, normalized size = 1.34

method	result
derivativedivides	$c^2\left(-\frac{da}{2c^2x^2} - da\ln(cx) + \frac{ibd\arcsin(cx)^2}{2} + \frac{idb}{2} - \frac{db\sqrt{-c^2x^2+1}}{2cx} - \frac{db\arcsin(cx)}{2c^2x^2} - db\arcsin(\right.$
default	$c^2\left(-\frac{da}{2c^2x^2} - da\ln(cx) + \frac{ibd\arcsin(cx)^2}{2} + \frac{idb}{2} - \frac{db\sqrt{-c^2x^2+1}}{2cx} - \frac{db\arcsin(cx)}{2c^2x^2} - db\arcsin(\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/2*d*a/c^2/x^2-d*a*ln(c*x)+1/2*I*d*b*arcsin(c*x)^2+1/2*I*d*b-1/2*d*b
/c/x*(-c^2*x^2+1)^(1/2)-1/2*d*b*arcsin(c*x)/c^2/x^2-d*b*arcsin(c*x)*ln(1-I*
```

```
c*x-(-c^2*x^2+1)^(1/2))-d*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*d*
b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+I*d*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(
1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -b*c^2*d*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) - a*c^2
*d*log(x) - 1/2*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a*d/x^
2
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{a}{x^{3}}\right)dx+\int\frac{ac^{2}}{x}\,dx+\int\left(-\frac{b\operatorname{asin}{\left(cx\right)}}{x^{3}}\right)dx+\int\frac{bc^{2}\operatorname{asin}{\left(cx\right)}}{x}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] -d*(Integral(-a/x**3, x) + Integral(a*c**2/x, x) + Integral(-b*asin(c*x)/x*
*3, x) + Integral(b*c**2*asin(c*x)/x, x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^3,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^3, x)
```

3.9 $\int \frac{(d-c^2dx^2)(a+b\mathbf{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=81

$$-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\text{ArcSin}(cx))}{3x^3}+\frac{c^2d(a+b\text{ArcSin}(cx))}{x}+\frac{5}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/3*d*(a+b*arcsin(c*x))/x^3+c^2*d*(a+b*arcsin(c*x))/x+5/6*b*c^3*d*arctanh(
(-c^2*x^2+1)^(1/2))-1/6*b*c*d*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.06, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {14, 4777, 12, 457, 79, 65, 214}

$$\frac{c^2d(a+b\text{ArcSin}(cx))}{x}-\frac{d(a+b\text{ArcSin}(cx))}{3x^3}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}+\frac{5}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d*Sqrt[1 - c^2*x^2])/x^2 - (d*(a + b*ArcSin[c*x]))/(3*x^3) + (c^2
*d*(a + b*ArcSin[c*x]))/x + (5*b*c^3*d*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
```

```
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{(d-c^2dx^2)(a+b\sin^{-1}(cx))}{x^4}\,dx &= -\frac{d(a+b\sin^{-1}(cx))}{3x^3}+\frac{c^2d(a+b\sin^{-1}(cx))}{x}-(bc)\int \frac{d(-1+3c^2x^2)}{3x^3\sqrt{1-c^2x^2}}\\
&= -\frac{d(a+b\sin^{-1}(cx))}{3x^3}+\frac{c^2d(a+b\sin^{-1}(cx))}{x}-\frac{1}{3}(bcd)\int \frac{-1+3c^2x^2}{x^3\sqrt{1-c^2x^2}}\\
&= -\frac{d(a+b\sin^{-1}(cx))}{3x^3}+\frac{c^2d(a+b\sin^{-1}(cx))}{x}-\frac{1}{6}(bcd)\text{Subst}\Bigg(\int \frac{-1}{x^2\sqrt{1}}\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\sin^{-1}(cx))}{3x^3}+\frac{c^2d(a+b\sin^{-1}(cx))}{x}-\frac{1}{12}(5\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\sin^{-1}(cx))}{3x^3}+\frac{c^2d(a+b\sin^{-1}(cx))}{x}+\frac{1}{6}(5b\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\sin^{-1}(cx))}{3x^3}+\frac{c^2d(a+b\sin^{-1}(cx))}{x}+\frac{5}{6}bc^3\end{aligned}$$

Mathematica [A]
time = 0.03, size = 93, normalized size = 1.15

$$-\frac{ad}{3x^3}+\frac{ac^2d}{x}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{bd\text{ArcSin}(cx)}{3x^3}+\frac{bc^2d\text{ArcSin}(cx)}{x}+\frac{5}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/3*(a*d)/x^3 + (a*c^2*d)/x - (b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (b*d*Arc
Sin[c*x])/(3*x^3) + (b*c^2*d*ArcSin[c*x])/x + (5*b*c^3*d*ArcTanh[Sqrt[1 - c
^2*x^2]])/6
```

Maple [A]
time = 0.01, size = 91, normalized size = 1.12

method	result
derivativedivides	$c^3\left(-da\left(\frac{1}{3c^3x^3}-\frac{1}{cx}\right)-db\left(\frac{\arcsin(cx)}{3c^3x^3}-\frac{\arcsin(cx)}{cx}+\frac{\sqrt{-c^2x^2+1}}{6c^2x^2}-\frac{5\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{6}\right.\right.$
default	$c^3\left(-da\left(\frac{1}{3c^3x^3}-\frac{1}{cx}\right)-db\left(\frac{\arcsin(cx)}{3c^3x^3}-\frac{\arcsin(cx)}{cx}+\frac{\sqrt{-c^2x^2+1}}{6c^2x^2}-\frac{5\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{6}\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-d*a*(1/3/c^3/x^3-1/c/x)-d*b*(1/3/c^3/x^3*arcsin(c*x)-1/c/x*arcsin(c*x
)+1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)-5/6*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.47, size = 123, normalized size = 1.52

$$\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bc^2d-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd+\frac{ac^2d}{x}-\frac{ad}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*c^2*d - 1
/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x
^2)*c + 2*arcsin(c*x)/x^3)*b*d + a*c^2*d/x - 1/3*a*d/x^3
```

Fricas [A]
time = 3.48, size = 109, normalized size = 1.35

$$\frac{5\,bc^{3}dx^{3}\log\left(\sqrt{-c^{2}x^{2}+1}+1\right)-5\,bc^{3}dx^{3}\log\left(\sqrt{-c^{2}x^{2}+1}-1\right)+12\,ac^{2}dx^{2}-2\,\sqrt{-c^{2}x^{2}+1}\,bcdx-4\,ad+4\,(3\,bc^{2}dx^{2}-bd)\arcsin\left(cx\right)}{12\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(5*b*c^3*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - 5*b*c^3*d*x^3*log(sqrt(-c
^2*x^2 + 1) - 1) + 12*a*c^2*d*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*c*d*x - 4*a*d +
4*(3*b*c^2*d*x^2 - b*d)*arcsin(c*x))/x^3
```

Sympy [A]
time = 3.39, size = 177, normalized size = 2.19

$$\frac{ac^{2}d}{x}-\frac{ad}{3x^{3}}-bc^{3}d\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^{2}x^{2}|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)+\frac{bc^{2}d\operatorname{asin}\left(cx\right)}{x}+\frac{bcd\left(\begin{cases}-\frac{c^{2}\operatorname{acosh}\left(\frac{1}{cx}\right)}{2}+\frac{c}{2x\sqrt{-1+\frac{1}{c^{2}x^{2}}}}-\frac{1}{2cx^{3}\sqrt{-1+\frac{1}{c^{2}x^{2}}}} & \text{for}\ \frac{1}{|c^{2}x^{2}|}>1\\ \frac{ic^{2}\operatorname{asin}\left(\frac{1}{cx}\right)}{2}-\frac{ic\sqrt{1-\frac{1}{c^{2}x^{2}}}}{2x} & \text{otherwise}\end{cases}\right)}{3}-\frac{bd\operatorname{asin}\left(cx\right)}{3x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] a*c**2*d/x - a*d/(3*x**3) - b*c**3*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2
*x**2) > 1), (I*asin(1/(c*x)), True)) + b*c**2*d*asin(c*x)/x + b*c*d*Piecew
ise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**
3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2
 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), True))/3 - b*d*asin(c*x)/(3*x**3)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 296 vs. 2(71) = 142.
time = 4.60, size = 296, normalized size = 3.65

$$-\frac{bc^{6}dx^{3}\arcsin\left(cx\right)}{24\left(\sqrt{-c^{2}x^{2}+1}+1\right)^{3}}-\frac{ac^{6}dx^{3}}{24\left(\sqrt{-c^{2}x^{2}+1}+1\right)^{3}}+\frac{bc^{5}dx^{2}}{24\left(\sqrt{-c^{2}x^{2}+1}+1\right)^{2}}+\frac{3\,bc^{4}dx\arcsin\left(cx\right)}{8\left(\sqrt{-c^{2}x^{2}+1}+1\right)}+\frac{3\,ac^{4}dx}{8\left(\sqrt{-c^{2}x^{2}+1}+1\right)}-\frac{5}{6}\,bc^{3}d\log\left(|c||x|\right)+\frac{5}{6}\,bc^{3}d\log\left(\sqrt{-c^{2}x^{2}+1}+1\right)+\frac{3\,bc^{2}d\left(\sqrt{-c^{2}x^{2}+1}+1\right)\arcsin\left(cx\right)}{8\,x}+\frac{3\,ac^{2}d\left(\sqrt{-c^{2}x^{2}+1}+1\right)}{8\,x}-\frac{bcd\left(\sqrt{-c^{2}x^{2}+1}+1\right)^{2}}{24\,x^{2}}-\frac{bd\left(\sqrt{-c^{2}x^{2}+1}+1\right)^{3}\arcsin\left(cx\right)}{24\,x^{3}}-\frac{ad\left(\sqrt{-c^{2}x^{2}+1}+1\right)^{3}}{24\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^6*d*x^3*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1)^3 - 1/24*a*c^6*d*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + 1/24*b*c^5*d*x^2/(sqrt(-c^2*x^2 + 1) + 1)^2 +
 3/8*b*c^4*d*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) + 3/8*a*c^4*d*x/(sqrt(-
c^2*x^2 + 1) + 1) - 5/6*b*c^3*d*log(abs(c)*abs(x)) + 5/6*b*c^3*d*log(sqrt(-
c^2*x^2 + 1) + 1) + 3/8*b*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x + 3/
8*a*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)/x - 1/24*b*c*d*(sqrt(-c^2*x^2 + 1) + 1)^
2/x^2 - 1/24*b*d*(sqrt(-c^2*x^2 + 1) + 1)^3*arcsin(c*x)/x^3 - 1/24*a*d*(sqr
t(-c^2*x^2 + 1) + 1)^3/x^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^4,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^4, x)
```

3.10 $\int x^4(d-c^2dx^2)^2(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=186

$$\frac{8bd^2\sqrt{1-c^2x^2}}{315c^5}+\frac{4bd^2(1-c^2x^2)^{3/2}}{945c^5}+\frac{bd^2(1-c^2x^2)^{5/2}}{525c^5}-\frac{10bd^2(1-c^2x^2)^{7/2}}{441c^5}+\frac{bd^2(1-c^2x^2)^{9/2}}{81c^5}+\frac{1}{5}d^2x^5(a+bA$$

```
[Out] 4/945*b*d^2*(-c^2*x^2+1)^(3/2)/c^5+1/525*b*d^2*(-c^2*x^2+1)^(5/2)/c^5-10/44
1*b*d^2*(-c^2*x^2+1)^(7/2)/c^5+1/81*b*d^2*(-c^2*x^2+1)^(9/2)/c^5+1/5*d^2*x^
5*(a+b*arcsin(c*x))-2/7*c^2*d^2*x^7*(a+b*arcsin(c*x))+1/9*c^4*d^2*x^9*(a+b*
arcsin(c*x))+8/315*b*d^2*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A]

time = 0.14, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {276, 4777, 12, 1265, 911, 1167}

$$\frac{1}{9}c^4d^2x^9(a+b\text{ArcSin}(cx))-\frac{2}{7}c^2d^2x^7(a+b\text{ArcSin}(cx))+\frac{1}{5}d^2x^5(a+b\text{ArcSin}(cx))+\frac{bd^2(1-c^2x^2)^{9/2}}{81c^5}-\frac{10bd^2(1-c^2x^2)^{7/2}}{441c^5}+\frac{bd^2(1-c^2x^2)^{5/2}}{525c^5}+\frac{4bd^2(1-c^2x^2)^{3/2}}{945c^5}+\frac{8bd^2\sqrt{1-c^2x^2}}{315c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(315*c^5) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(945*
c^5) + (b*d^2*(1 - c^2*x^2)^(5/2))/(525*c^5) - (10*b*d^2*(1 - c^2*x^2)^(7/2
))/(441*c^5) + (b*d^2*(1 - c^2*x^2)^(9/2))/(81*c^5) + (d^2*x^5*(a + b*ArcSi
n[c*x]))/5 - (2*c^2*d^2*x^7*(a + b*ArcSin[c*x]))/7 + (c^4*d^2*x^9*(a + b*Ar
cSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
```

```
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)-\frac{2}{7}c^2d^2x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}c^4d^2x^9\left(a+\right.$$

$$=\frac{8bd^2\sqrt{1-c^2x^2}}{315c^5}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{945c^5}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{525c^5}-\frac{10bd^2(1}{4}$$

Mathematica [A]
time = 0.07, size = 119, normalized size = 0.64

$$\frac{d^2\left(315ac^5x^5(63-90c^2x^2+35c^4x^4)+b\sqrt{1-c^2x^2}\,(2104+1052c^2x^2+789c^4x^4-2650c^6x^6+1225c^8x^8)+315bc^5x^5(63-90c^2x^2+35c^4x^4)\,\mathrm{ArcSin}(cx)\right)}{99225c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(315*a*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(2
104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^8) + 315*b*c^5
*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4)*ArcSin[c*x]))/(99225*c^5)
```

Maple [A]
time = 0.08, size = 172, normalized size = 0.92

method	result
derivativedivides	$\frac{d^2a\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{2\arcsin(cx)c^7x^7}{7}+\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^8x^8\sqrt{-c^2x^2+1}}{81}-\frac{106c^6x^6\sqrt{}}{}\right.}{c^5}$
default	$\frac{d^2a\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{2\arcsin(cx)c^7x^7}{7}+\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^8x^8\sqrt{-c^2x^2+1}}{81}-\frac{106c^6x^6\sqrt{}}{}\right.}{c^5}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(d^2*a*(1/9*c^9*x^9-2/7*c^7*x^7+1/5*c^5*x^5)+d^2*b*(1/9*arcsin(c*x)*c
^9*x^9-2/7*arcsin(c*x)*c^7*x^7+1/5*arcsin(c*x)*c^5*x^5+1/81*c^8*x^8*(-c^2*x
^2+1)^(1/2)-106/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+263/33075*c^4*x^4*(-c^2*x^2
+1)^(1/2)+1052/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)+2104/99225*(-c^2*x^2+1)^(1/
2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 328 vs. 2(160) = 320.
time = 0.49, size = 328, normalized size = 1.76

$$\frac{1}{9}ac^4d^2x^9-\frac{2}{7}ac^2d^2x^7+\frac{1}{2835}\left(315x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}\,x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}\,x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}\,x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}\,x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right)bc^4d^2+\frac{1}{5}ad^2x^5-\frac{2}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bc^2d^2+\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*c^4*d^2*x^9 - 2/7*a*c^2*d^2*x^7 + 1/2835*(315*x^9*arcsin(c*x) + (35*s
qrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^
2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^1
0)*c)*b*c^4*d^2 + 1/5*a*d^2*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*
```

```
x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/
c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^2*d^2 + 1/75*(15*x^5*arcsin(c*x) +
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c)*b*d^2
```

Fricas [A]
time = 3.79, size = 153, normalized size = 0.82

$$\frac{11025\,ac^9d^2x^9 - 28350\,ac^7d^2x^7 + 19845\,ac^5d^2x^5 + 315\,(35\,bc^9d^2x^9 - 90\,bc^7d^2x^7 + 63\,bc^5d^2x^5)\arcsin(cx) + (1225\,bc^8d^2x^8 - 2650\,bc^6d^2x^6 + 789\,bc^4d^2x^4 + 1052\,bc^2d^2x^2 + 2104\,bd^2)\sqrt{-c^2x^2+1}}{99225\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*d^2*x^9 - 28350*a*c^7*d^2*x^7 + 19845*a*c^5*d^2*x^5 +
315*(35*b*c^9*d^2*x^9 - 90*b*c^7*d^2*x^7 + 63*b*c^5*d^2*x^5)*arcsin(c*x) +
(1225*b*c^8*d^2*x^8 - 2650*b*c^6*d^2*x^6 + 789*b*c^4*d^2*x^4 + 1052*b*c^2*d
^2*x^2 + 2104*b*d^2)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 1.51, size = 230, normalized size = 1.24

$$\begin{cases} \frac{ac^4d^2x^9}{9} - \frac{2ac^2d^2x^7}{7} + \frac{ad^2x^5}{5} + \frac{bc^4d^2x^9\operatorname{asin}(cx)}{9} + \frac{bc^3d^2x^8\sqrt{-c^2x^2+1}}{81} - \frac{2bc^2d^2x^7\operatorname{asin}(cx)}{7} - \frac{106bcd^2x^6\sqrt{-c^2x^2+1}}{3969} + \frac{bd^2x^5\operatorname{asin}(cx)}{5} + \frac{263bd^2x^4\sqrt{-c^2x^2+1}}{33075c} + \frac{1052bd^2x^2\sqrt{-c^2x^2+1}}{99225c^3} + \frac{2104bd^2\sqrt{-c^2x^2+1}}{99225c^5} & \text{for } c \neq 0 \\ \frac{ad^2x^5}{5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**9/9 - 2*a*c**2*d**2*x**7/7 + a*d**2*x**5/5 + b*c*
*4*d**2*x**9*asin(c*x)/9 + b*c**3*d**2*x**8*sqrt(-c**2*x**2 + 1)/81 - 2*b*c
**2*d**2*x**7*asin(c*x)/7 - 106*b*c*d**2*x**6*sqrt(-c**2*x**2 + 1)/3969 + b
*d**2*x**5*asin(c*x)/5 + 263*b*d**2*x**4*sqrt(-c**2*x**2 + 1)/(33075*c) + 1
052*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(99225*c**3) + 2104*b*d**2*sqrt(-c**2*
x**2 + 1)/(99225*c**5), Ne(c, 0)), (a*d**2*x**5/5, True))
```

Giac [A]
time = 0.43, size = 284, normalized size = 1.53

$$\frac{1}{9}\,ac^4d^2x^9 - \frac{2}{7}\,ac^2d^2x^7 + \frac{1}{5}\,ad^2x^5 + \frac{(c^2x^2-1)^4bd^2x\arcsin(cx)}{9\,c^4} + \frac{10\,(c^2x^2-1)^3bd^2x\arcsin(cx)}{63\,c^4} + \frac{(c^2x^2-1)^2bd^2x\arcsin(cx)}{105\,c^4} + \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}\,bd^2}{81\,c^5} - \frac{4\,(c^2x^2-1)bd^2x\arcsin(cx)}{315\,c^4} + \frac{10\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bd^2}{441\,c^5} + \frac{8\,bd^2x\arcsin(cx)}{315\,c^4} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^2}{525\,c^5} + \frac{4\,(-c^2x^2+1)^{\frac{3}{2}}bd^2}{945\,c^5} + \frac{8\,\sqrt{-c^2x^2+1}\,bd^2}{315\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*c^4*d^2*x^9 - 2/7*a*c^2*d^2*x^7 + 1/5*a*d^2*x^5 + 1/9*(c^2*x^2 - 1)^4
*b*d^2*x*arcsin(c*x)/c^4 + 10/63*(c^2*x^2 - 1)^3*b*d^2*x*arcsin(c*x)/c^4 +
1/105*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(c*x)/c^4 + 1/81*(c^2*x^2 - 1)^4*sqrt(-
c^2*x^2 + 1)*b*d^2/c^5 - 4/315*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^4 + 10/4
```

```
41*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 8/315*b*d^2*x*arcsin(c*x)
/c^4 + 1/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 4/945*(-c^2*x^2
 + 1)^(3/2)*b*d^2/c^5 + 8/315*sqrt(-c^2*x^2 + 1)*b*d^2/c^5
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.11 $\int x^3(d-c^2dx^2)^2 (a+b\text{ArcSin}(cx))\,dx$

Optimal. Leaf size=184

$$\frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3}+\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}-\frac{73bd^2\text{ArcSin}(cx)}{3072c^4}+\frac{1}{4}$$

```
[Out] -73/3072*b*d^2*arcsin(c*x)/c^4+1/4*d^2*x^4*(a+b*arcsin(c*x))-1/3*c^2*d^2*x^
6*(a+b*arcsin(c*x))+1/8*c^4*d^2*x^8*(a+b*arcsin(c*x))+73/3072*b*d^2*x*(-c^2
*x^2+1)^(1/2)/c^3+73/4608*b*d^2*x^3*(-c^2*x^2+1)^(1/2)/c-43/1152*b*c*d^2*x^
5*(-c^2*x^2+1)^(1/2)+1/64*b*c^3*d^2*x^7*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {272, 45, 4777, 12, 1281, 470, 327, 222}

$$\frac{1}{8}c^4d^2x^8(a+b\text{ArcSin}(cx))-\frac{1}{3}c^2d^2x^6(a+b\text{ArcSin}(cx))+\frac{1}{4}d^2x^4(a+b\text{ArcSin}(cx))-\frac{73bd^2\text{ArcSin}(cx)}{3072c^4}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}+\frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3}+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (73*b*d^2*x*Sqrt[1 - c^2*x^2])/(3072*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]
)/(4608*c) - (43*b*c*d^2*x^5*Sqrt[1 - c^2*x^2])/1152 + (b*c^3*d^2*x^7*Sqrt[
1 - c^2*x^2])/64 - (73*b*d^2*ArcSin[c*x])/(3072*c^4) + (d^2*x^4*(a + b*ArcS
in[c*x]))/4 - (c^2*d^2*x^6*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^8*(a + b*Arc
Sin[c*x]))/8
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}c^4d^2x^8(a+$$
$$=\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}c^4d^2x^8(a+$$
$$=\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)-\frac{1}{3}c^2d^2x^6(a+b\,\mathrm{si}$$
$$=-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}+\frac{1}{4}d^2x^4(a+b\sin^-$$
$$=\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}$$
$$=\frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3}+\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+$$
$$=\frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3}+\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c}-\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+$$

Mathematica [A]
time = 0.07, size = 115, normalized size = 0.62

$$\frac{d^2\left(384ac^4x^4(6-8c^2x^2+3c^4x^4)+bcx\sqrt{1-c^2x^2}\,(219+146c^2x^2-344c^4x^4+144c^6x^6)+3b(-73+768c^4x^4-1024c^6x^6+384c^8x^8)\,\mathrm{ArcSin}(cx)\right)}{9216c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(384*a*c^4*x^4*(6 - 8*c^2*x^2 + 3*c^4*x^4) + b*c*x*Sqrt[1 - c^2*x^2]*(
219 + 146*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6) + 3*b*(-73 + 768*c^4*x^4 - 1
024*c^6*x^6 + 384*c^8*x^8)*ArcSin[c*x]))/(9216*c^4)
```

Maple [A]
time = 0.07, size = 160, normalized size = 0.87

method	result
derivativedivides	$\frac{d^2a\left(\frac{1}{8}c^8x^8-\frac{1}{3}c^6x^6+\frac{1}{4}c^4x^4\right)+d^2b\left(\frac{\arcsin(cx)c^8x^8}{8}-\frac{\arcsin(cx)c^6x^6}{3}+\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^7x^7\sqrt{-c^2x^2+1}}{64}-\frac{43c^5x^5\sqrt{-c}}{11}\right.}{c^4}$
default	$\frac{d^2a\left(\frac{1}{8}c^8x^8-\frac{1}{3}c^6x^6+\frac{1}{4}c^4x^4\right)+d^2b\left(\frac{\arcsin(cx)c^8x^8}{8}-\frac{\arcsin(cx)c^6x^6}{3}+\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^7x^7\sqrt{-c^2x^2+1}}{64}-\frac{43c^5x^5\sqrt{-c}}{11}\right.}{c^4}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/c^4*(d^2*a*(1/8*c^8*x^8-1/3*c^6*x^6+1/4*c^4*x^4)+d^2*b*(1/8*arcsin(c*x)*c^8*x^8-1/3*arcsin(c*x)*c^6*x^6+1/4*c^4*x^4*arcsin(c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(1/2)-43/1152*c^5*x^5*(-c^2*x^2+1)^(1/2)+73/4608*c^3*x^3*(-c^2*x^2+1)^(1/2)+73/3072*c*x*(-c^2*x^2+1)^(1/2)-73/3072*arcsin(c*x)))

Maxima [A]
time = 0.49, size = 298, normalized size = 1.62

$$\frac{1}{8}\,ac^4d^2x^8 - \frac{1}{3}\,ac^2d^2x^6 + \frac{1}{3072}\left(384\,x^8\arcsin\left(cx\right) + \left(\frac{48\,\sqrt{-c^2x^2+1}\,x^7}{c^2} + \frac{56\,\sqrt{-c^2x^2+1}\,x^5}{c^4} + \frac{70\,\sqrt{-c^2x^2+1}\,x^3}{c^6} + \frac{105\,\sqrt{-c^2x^2+1}\,x}{c^8} - \frac{105\,\arcsin\left(cx\right)}{c^9}\right)c\right)bc^4d^2 + \frac{1}{4}\,ad^2x^4 - \frac{1}{144}\left(48\,x^6\arcsin\left(cx\right) + \left(\frac{8\,\sqrt{-c^2x^2+1}\,x^5}{c^2} + \frac{10\,\sqrt{-c^2x^2+1}\,x^3}{c^4} + \frac{15\,\sqrt{-c^2x^2+1}\,x}{c^6} - \frac{15\,\arcsin\left(cx\right)}{c^7}\right)c\right)bc^2d^2 + \frac{1}{32}\left(8\,x^4\arcsin\left(cx\right) + \left(\frac{2\,\sqrt{-c^2x^2+1}\,x^3}{c^2} + \frac{3\,\sqrt{-c^2x^2+1}\,x}{c^4} - \frac{3\,\arcsin\left(cx\right)}{c^5}\right)c\right)bd^2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] 1/8*a*c^4*d^2*x^8 - 1/3*a*c^2*d^2*x^6 + 1/3072*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*c^4*d^2 + 1/4*a*d^2*x^4 - 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*c^2*d^2 + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^2

Fricas [A]
time = 3.65, size = 149, normalized size = 0.81

$$\frac{1152\,ac^8d^2x^8 - 3072\,ac^6d^2x^6 + 2304\,ac^4d^2x^4 + 3\,(384\,bc^8d^2x^8 - 1024\,bc^6d^2x^6 + 768\,bc^4d^2x^4 - 73\,bd^2)\arcsin\left(cx\right) + (144\,bc^7d^2x^7 - 344\,bc^5d^2x^5 + 146\,bc^3d^2x^3 + 219\,bcd^2x)\sqrt{-c^2x^2+1}}{9216\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] 1/9216*(1152*a*c^8*d^2*x^8 - 3072*a*c^6*d^2*x^6 + 2304*a*c^4*d^2*x^4 + 3*(384*b*c^8*d^2*x^8 - 1024*b*c^6*d^2*x^6 + 768*b*c^4*d^2*x^4 - 73*b*d^2)*arcsin(c*x) + (144*b*c^7*d^2*x^7 - 344*b*c^5*d^2*x^5 + 146*b*c^3*d^2*x^3 + 219*b*c*d^2*x)*sqrt(-c^2*x^2 + 1))/c^4

Sympy [A]
time = 1.08, size = 218, normalized size = 1.18

$$\begin{cases} \frac{ac^4d^2x^8}{8} - \frac{ac^2d^2x^6}{3} + \frac{ad^2x^4}{4} + \frac{bc^4d^2x^8\operatorname{asin}(cx)}{8} + \frac{bc^3d^2x^7\sqrt{-c^2x^2+1}}{64} - \frac{bc^2d^2x^6\operatorname{asin}(cx)}{3} - \frac{43bcd^2x^5\sqrt{-c^2x^2+1}}{1152} + \frac{bd^2x^4\operatorname{asin}(cx)}{4} + \frac{73bd^2x^3\sqrt{-c^2x^2+1}}{4608c} + \frac{73bd^2x\sqrt{-c^2x^2+1}}{3072c^3} - \frac{73bd^2\operatorname{asin}(cx)}{3072c^4} & \text{for}\ c \neq 0 \\ \frac{ad^2x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**3*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)

[Out] Piecewise((a*c**4*d**2*x**8/8 - a*c**2*d**2*x**6/3 + a*d**2*x**4/4 + b*c**4*d**2*x**8*asin(c*x)/8 + b*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)/64 - b*c**2*

```
d**2*x**6*asin(c*x)/3 - 43*b*c*d**2*x**5*sqrt(-c**2*x**2 + 1)/1152 + b*d**2
*x**4*asin(c*x)/4 + 73*b*d**2*x**3*sqrt(-c**2*x**2 + 1)/(4608*c) + 73*b*d**
2*x*sqrt(-c**2*x**2 + 1)/(3072*c**3) - 73*b*d**2*asin(c*x)/(3072*c**4), Ne(
c, 0)), (a*d**2*x**4/4, True))
```

Giac [A]
time = 0.43, size = 205, normalized size = 1.11

$$\frac{1}{8}\,ac^4d^2x^8-\frac{1}{3}\,ac^2d^2x^6+\frac{1}{4}\,ad^2x^4+\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}\,bd^2x}{64\,c^3}+\frac{\left(c^2x^2-1\right)^4bd^2\arcsin\left(cx\right)}{8\,c^4}+\frac{11\,\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\,bd^2x}{1152\,c^3}+\frac{\left(c^2x^2-1\right)^3bd^2\arcsin\left(cx\right)}{6\,c^4}+\frac{55\,\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^2x}{4608\,c^3}+\frac{55\,\sqrt{-c^2x^2+1}\,bd^2x}{3072\,c^3}+\frac{55\,bd^2\arcsin\left(cx\right)}{3072\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/8*a*c^4*d^2*x^8 - 1/3*a*c^2*d^2*x^6 + 1/4*a*d^2*x^4 + 1/64*(c^2*x^2 - 1)^
3*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 1/8*(c^2*x^2 - 1)^4*b*d^2*arcsin(c*x)/c^
4 + 11/1152*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 1/6*(c^2*x^2 -
 1)^3*b*d^2*arcsin(c*x)/c^4 + 55/4608*(-c^2*x^2 + 1)^(3/2)*b*d^2*x/c^3 + 55
/3072*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 55/3072*b*d^2*arcsin(c*x)/c^4
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.12 $\int x^2(d-c^2dx^2)^2(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=161

$$\frac{8bd^2\sqrt{1-c^2x^2}}{105c^3}+\frac{4bd^2(1-c^2x^2)^{3/2}}{315c^3}+\frac{bd^2(1-c^2x^2)^{5/2}}{175c^3}-\frac{bd^2(1-c^2x^2)^{7/2}}{49c^3}+\frac{1}{3}d^2x^3(a+b\mathrm{ArcSin}(cx))-\frac{2}{5}c^2d^2x^5$$

```
[Out] 4/315*b*d^2*(-c^2*x^2+1)^(3/2)/c^3+1/175*b*d^2*(-c^2*x^2+1)^(5/2)/c^3-1/49*
b*d^2*(-c^2*x^2+1)^(7/2)/c^3+1/3*d^2*x^3*(a+b*arcsin(c*x))-2/5*c^2*d^2*x^5*
(a+b*arcsin(c*x))+1/7*c^4*d^2*x^7*(a+b*arcsin(c*x))+8/105*b*d^2*(-c^2*x^2+1
)^(1/2)/c^3
```

Rubi [A]
time = 0.12, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}=0.200$, Rules used = {276, 4777, 12, 1265, 785}

$$\frac{1}{7}c^4d^2x^7(a+b\mathrm{ArcSin}(cx))-\frac{2}{5}c^2d^2x^5(a+b\mathrm{ArcSin}(cx))+\frac{1}{3}d^2x^3(a+b\mathrm{ArcSin}(cx))-\frac{bd^2(1-c^2x^2)^{7/2}}{49c^3}+\frac{bd^2(1-c^2x^2)^{5/2}}{175c^3}+\frac{4bd^2(1-c^2x^2)^{3/2}}{315c^3}+\frac{8bd^2\sqrt{1-c^2x^2}}{105c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(105*c^3) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(315*
c^3) + (b*d^2*(1 - c^2*x^2)^(5/2))/(175*c^3) - (b*d^2*(1 - c^2*x^2)^(7/2))/
(49*c^3) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 - (2*c^2*d^2*x^5*(a + b*ArcSin[c
*x]))/5 + (c^4*d^2*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 785

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (
c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && NeQ[b^
2 - 4*a*c, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0] && IntegerQ[m]))
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)-\frac{2}{5}c^2d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}c^4d^2x^7\left(a+\right.$$

$$=\frac{8bd^2\sqrt{1-c^2x^2}}{105c^3}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{315c^3}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{175c^3}-\frac{bd^2(1-}{4\ldots}$$

Mathematica [A]
time = 0.06, size = 111, normalized size = 0.69

$$\frac{d^2\left(105ac^3x^3(35-42c^2x^2+15c^4x^4)+b\sqrt{1-c^2x^2}\,(818+409c^2x^2-612c^4x^4+225c^6x^6)+105bc^3x^3(35-42c^2x^2+15c^4x^4)\,\mathrm{ArcSin}(cx)\right)}{11025c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(105*a*c^3*x^3*(35 - 42*c^2*x^2 + 15*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(8
18 + 409*c^2*x^2 - 612*c^4*x^4 + 225*c^6*x^6) + 105*b*c^3*x^3*(35 - 42*c^2*
x^2 + 15*c^4*x^4)*ArcSin[c*x]))/(11025*c^3)
```

Maple [A]
time = 0.08, size = 152, normalized size = 0.94

method	result
derivativedivides	$\frac{d^2a\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{2\arcsin(cx)c^5x^5}{5}+\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{68c^4x^4\sqrt{}}{}\right.}{c^3}$
default	$\frac{d^2a\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{2\arcsin(cx)c^5x^5}{5}+\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{68c^4x^4\sqrt{}}{}\right.}{c^3}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/c^3*(d^2*a*(1/7*c^7*x^7-2/5*c^5*x^5+1/3*c^3*x^3)+d^2*b*(1/7*arcsin(c*x)*c^7*x^7-2/5*arcsin(c*x)*c^5*x^5+1/3*c^3*x^3*arcsin(c*x)+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-68/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)+409/11025*c^2*x^2*(-c^2*x^2+1)^(1/2)+818/11025*(-c^2*x^2+1)^(1/2)))

Maxima [A]
time = 0.49, size = 267, normalized size = 1.66

$$\frac{1}{7}ac^4d^2x^7-\frac{2}{5}ac^2d^2x^5+\frac{1}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bc^4d^2-\frac{2}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^2d^2+\frac{1}{3}ad^2x^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] 1/7*a*c^4*d^2*x^7 - 2/5*a*c^2*d^2*x^5 + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^4*d^2 - 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^2*d^2 + 1/3*a*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2

Fricas [A]
time = 3.12, size = 141, normalized size = 0.88

$$\frac{1575\,ac^7d^2x^7-4410\,ac^5d^2x^5+3675\,ac^3d^2x^3+105\,(15\,bc^7d^2x^7-42\,bc^5d^2x^5+35\,bc^3d^2x^3)\arcsin(cx)+(225\,bc^6d^2x^6-612\,bc^4d^2x^4+409\,bc^2d^2x^2+818\,bd^2)\sqrt{-c^2x^2+1}}{11025\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] 1/11025*(1575*a*c^7*d^2*x^7 - 4410*a*c^5*d^2*x^5 + 3675*a*c^3*d^2*x^3 + 105*(15*b*c^7*d^2*x^7 - 42*b*c^5*d^2*x^5 + 35*b*c^3*d^2*x^3)*arcsin(c*x) + (225*b*c^6*d^2*x^6 - 612*b*c^4*d^2*x^4 + 409*b*c^2*d^2*x^2 + 818*b*d^2)*sqrt(-c^2*x^2 + 1))/c^3

Sympy [A]
time = 0.89, size = 202, normalized size = 1.25

$$\begin{cases} \frac{ac^4d^2x^7}{7} - \frac{2ac^2d^2x^5}{5} + \frac{ad^2x^3}{3} + \frac{bc^4d^2x^7 \operatorname{asin}{(cx)}}{7} + \frac{bc^3d^2x^6\sqrt{-c^2x^2+1}}{49} - \frac{2bc^2d^2x^5 \operatorname{asin}{(cx)}}{5} - \frac{68bcd^2x^4\sqrt{-c^2x^2+1}}{1225} + \frac{bd^2x^3 \operatorname{asin}{(cx)}}{3} + \frac{409bd^2x^2\sqrt{-c^2x^2+1}}{11025c} + \frac{818bd^2\sqrt{-c^2x^2+1}}{11025c^3} & \text{for}\: c \neq 0 \\ \frac{ad^2x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**7/7 - 2*a*c**2*d**2*x**5/5 + a*d**2*x**3/3 + b*c*
*4*d**2*x**7*asin(c*x)/7 + b*c**3*d**2*x**6*sqrt(-c**2*x**2 + 1)/49 - 2*b*c
**2*d**2*x**5*asin(c*x)/5 - 68*b*c*d**2*x**4*sqrt(-c**2*x**2 + 1)/1225 + b*
d**2*x**3*asin(c*x)/3 + 409*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(11025*c) + 81
8*b*d**2*sqrt(-c**2*x**2 + 1)/(11025*c**3), Ne(c, 0)), (a*d**2*x**3/3, True
))
```

Giac [A]
time = 0.42, size = 227, normalized size = 1.41

$$\frac{1}{7}\,ac^4d^2x^7 - \frac{2}{5}\,ac^2d^2x^5 + \frac{1}{3}\,ad^2x^3 + \frac{(c^2x^2-1)^3bd^2x\arcsin(cx)}{7\,c^2} + \frac{(c^2x^2-1)^2bd^2x\arcsin(cx)}{35\,c^2} - \frac{4\,(c^2x^2-1)bd^2x\arcsin(cx)}{105\,c^2} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bd^2}{49\,c^3} + \frac{8\,bd^2x\arcsin(cx)}{105\,c^2} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^2}{175\,c^3} + \frac{4\,(-c^2x^2+1)^{\frac{3}{2}}bd^2}{315\,c^3} + \frac{8\,\sqrt{-c^2x^2+1}\,bd^2}{105\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*c^4*d^2*x^7 - 2/5*a*c^2*d^2*x^5 + 1/3*a*d^2*x^3 + 1/7*(c^2*x^2 - 1)^3
*b*d^2*x*arcsin(c*x)/c^2 + 1/35*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(c*x)/c^2 - 4
/105*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^2 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2
*x^2 + 1)*b*d^2/c^3 + 8/105*b*d^2*x*arcsin(c*x)/c^2 + 1/175*(c^2*x^2 - 1)^2
*sqrt(-c^2*x^2 + 1)*b*d^2/c^3 + 4/315*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^3 + 8/10
5*sqrt(-c^2*x^2 + 1)*b*d^2/c^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.13 $\int x(d-c^2dx^2)^2\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=124

$$\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}+\frac{5bd^2\text{ArcSin}(cx)}{96c^2}-\frac{d^2(1-c^2x^2)^3\,(a+b\text{ArcSin}(cx))}{6c^2}$$

```
[Out] 5/144*b*d^2*x*(-c^2*x^2+1)^(3/2)/c+1/36*b*d^2*x*(-c^2*x^2+1)^(5/2)/c+5/96*b
*d^2*arcsin(c*x)/c^2-1/6*d^2*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))/c^2+5/96*b*d^
2*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.05, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {4767, 201, 222}

$$-\frac{d^2(1-c^2x^2)^3\,(a+b\text{ArcSin}(cx))}{6c^2}+\frac{5bd^2\text{ArcSin}(cx)}{96c^2}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*d^2*x*Sqrt[1 - c^2*x^2])/(96*c) + (5*b*d^2*x*(1 - c^2*x^2)^(3/2))/(144
*c) + (b*d^2*x*(1 - c^2*x^2)^(5/2))/(36*c) + (5*b*d^2*ArcSin[c*x])/(96*c^2)
 - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(6*c^2)
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx = -\frac{d^2(1-c^2x^2)^3\left(a+b\sin^{-1}(cx)\right)}{6c^2}+\frac{(bd^2)\int(1-c^2x^2)^{5/2}\,dx}{6c}$$
$$=\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}-\frac{d^2(1-c^2x^2)^3\left(a+b\sin^{-1}(cx)\right)}{6c^2}+\frac{(5bd^2)\int(1-}{36}$$
$$=\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}-\frac{d^2(1-c^2x^2)^3\left(a+b\sin^{-1}\right.}{6c^2}$$
$$=\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}-\frac{d^2(1}{}$$
$$=\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}+\frac{5bd^2}{}$$

Mathematica [A]
time = 0.04, size = 94, normalized size = 0.76

$$\frac{d^2\left(48a(-1+c^2x^2)^3+bcx\sqrt{1-c^2x^2}\,(33-26c^2x^2+8c^4x^4)+3b(-11+48c^2x^2-48c^4x^4+16c^6x^6)\,\mathrm{ArcSin}(cx)\right)}{288c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(48*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*
c^4*x^4) + 3*b*(-11 + 48*c^2*x^2 - 48*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]))/(
288*c^2)
```

Maple [A]
time = 0.07, size = 127, normalized size = 1.02

method	result
derivativedivides	$\frac{\frac{d^2\left(c^2x^2-1\right)^3a}{6}+d^2b\left(\frac{\arcsin(cx)c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{2}+\frac{c^2x^2\arcsin(cx)}{2}-\frac{11\arcsin(cx)}{96}+\frac{c^5x^5\sqrt{-c^2x^2+1}}{36}-\frac{13c^3x^3\sqrt{-}}{14}\right.}{c^2}$
default	$\frac{\frac{d^2\left(c^2x^2-1\right)^3a}{6}+d^2b\left(\frac{\arcsin(cx)c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{2}+\frac{c^2x^2\arcsin(cx)}{2}-\frac{11\arcsin(cx)}{96}+\frac{c^5x^5\sqrt{-c^2x^2+1}}{36}-\frac{13c^3x^3\sqrt{-}}{14}\right.}{c^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/6*d^2*(c^2*x^2-1)^3*a+d^2*b*(1/6*arcsin(c*x)*c^6*x^6-1/2*c^4*x^4*a
rcsin(c*x)+1/2*c^2*x^2*arcsin(c*x)-11/96*arcsin(c*x)+1/36*c^5*x^5*(-c^2*x^2
+1)^(1/2)-13/144*c^3*x^3*(-c^2*x^2+1)^(1/2)+11/96*c*x*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 237 vs. $2(107) = 214$.
time = 0.48, size = 237, normalized size = 1.91

$$\frac{1}{6}ac^4d^2x^6 - \frac{1}{2}ac^2d^2x^4 + \frac{1}{288}\left(48x^6\arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}\,x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}\,x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}\,x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right)c\right)bc^4d^2 - \frac{1}{16}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}\,x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}\,x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bc^2d^2 + \frac{1}{2}ad^2x^2 + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}\,x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*c^4*d^2*x^6 - 1/2*a*c^2*d^2*x^4 + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt
(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 +
 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*c^4*d^2 - 1/16*(8*x^4*arcsin(c*x) + (2
*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^
5)*c)*b*c^2*d^2 + 1/2*a*d^2*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2
 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2
```

Fricas [A]
time = 3.07, size = 137, normalized size = 1.10

$$\frac{48\,ac^6d^2x^6 - 144\,ac^4d^2x^4 + 144\,ac^2d^2x^2 + 3\,(16\,bc^6d^2x^6 - 48\,bc^4d^2x^4 + 48\,bc^2d^2x^2 - 11\,bd^2)\arcsin(cx) + (8\,bc^5d^2x^5 - 26\,bc^3d^2x^3 + 33\,bcd^2x)\sqrt{-c^2x^2+1}}{288\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*d^2*x^6 - 144*a*c^4*d^2*x^4 + 144*a*c^2*d^2*x^2 + 3*(16*b*c
^6*d^2*x^6 - 48*b*c^4*d^2*x^4 + 48*b*c^2*d^2*x^2 - 11*b*d^2)*arcsin(c*x) +
(8*b*c^5*d^2*x^5 - 26*b*c^3*d^2*x^3 + 33*b*c*d^2*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A]
time = 0.52, size = 190, normalized size = 1.53

$$\begin{cases} \frac{ac^4d^2x^6}{6} - \frac{ac^2d^2x^4}{2} + \frac{ad^2x^2}{2} + \frac{bc^4d^2x^6\operatorname{asin}(cx)}{6} + \frac{bc^3d^2x^5\sqrt{-c^2x^2+1}}{36} - \frac{bc^2d^2x^4\operatorname{asin}(cx)}{2} - \frac{13bcd^2x^3\sqrt{-c^2x^2+1}}{144} + \frac{bd^2x^2\operatorname{asin}(cx)}{2} + \frac{11bd^2x\sqrt{-c^2x^2+1}}{96c} - \frac{11bd^2\operatorname{asin}(cx)}{96c^2} & \text{for } c \neq 0 \\ \frac{ad^2x^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**6/6 - a*c**2*d**2*x**4/2 + a*d**2*x**2/2 + b*c**4
*d**2*x**6*asin(c*x)/6 + b*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)/36 - b*c**2*
d**2*x**4*asin(c*x)/2 - 13*b*c*d**2*x**3*sqrt(-c**2*x**2 + 1)/144 + b*d**2*
x**2*asin(c*x)/2 + 11*b*d**2*x*sqrt(-c**2*x**2 + 1)/(96*c) - 11*b*d**2*asin
(c*x)/(96*c**2), Ne(c, 0)), (a*d**2*x**2/2, True))
```

Giac [A]
time = 0.43, size = 157, normalized size = 1.27

$$\frac{1}{6}\,ac^4d^2x^6 - \frac{1}{2}\,ac^2d^2x^4 + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^2x}{36\,c} + \frac{(c^2x^2-1)^3bd^2\arcsin(cx)}{6\,c^2} + \frac{5\,(-c^2x^2+1)^{\frac{3}{2}}bd^2x}{144\,c} + \frac{5\sqrt{-c^2x^2+1}\,bd^2x}{96\,c} + \frac{(c^2x^2-1)ad^2}{2\,c^2} + \frac{5\,bd^2\arcsin(cx)}{96\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/6*a*c^4*d^2*x^6 - 1/2*a*c^2*d^2*x^4 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
+ 1)*b*d^2*x/c + 1/6*(c^2*x^2 - 1)^3*b*d^2*arcsin(c*x)/c^2 + 5/144*(-c^2*x^
2 + 1)^(3/2)*b*d^2*x/c + 5/96*sqrt(-c^2*x^2 + 1)*b*d^2*x/c + 1/2*(c^2*x^2 -
 1)*a*d^2/c^2 + 5/96*b*d^2*arcsin(c*x)/c^2
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.14 $\int (d-c^2dx^2)^2 (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=131

$$\frac{8bd^2\sqrt{1-c^2x^2}}{15c}+\frac{4bd^2(1-c^2x^2)^{3/2}}{45c}+\frac{bd^2(1-c^2x^2)^{5/2}}{25c}+d^2x(a+b\text{ArcSin}(cx))-\frac{2}{3}c^2d^2x^3(a+b\text{ArcSin}(cx))+\frac{1}{5}$$

```
[Out] 4/45*b*d^2*(-c^2*x^2+1)^(3/2)/c+1/25*b*d^2*(-c^2*x^2+1)^(5/2)/c+d^2*x*(a+b*
arcsin(c*x))-2/3*c^2*d^2*x^3*(a+b*arcsin(c*x))+1/5*c^4*d^2*x^5*(a+b*arcsin(
c*x))+8/15*b*d^2*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.07, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.227$, Rules used = {200, 4739, 12, 1261, 712}

$$\frac{1}{5}c^4d^2x^5(a+b\text{ArcSin}(cx))-\frac{2}{3}c^2d^2x^3(a+b\text{ArcSin}(cx))+d^2x(a+b\text{ArcSin}(cx))+\frac{bd^2(1-c^2x^2)^{5/2}}{25c}+\frac{4bd^2(1-c^2x^2)^{3/2}}{45c}+\frac{8bd^2\sqrt{1-c^2x^2}}{15c}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(15*c) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(45*c) +
 (b*d^2*(1 - c^2*x^2)^(5/2))/(25*c) + d^2*x*(a + b*ArcSin[c*x]) - (2*c^2*d^
2*x^3*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
```

```
x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)\,dx = d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin\right.$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin\right.$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin\right.$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)-\frac{2}{3}c^2d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}c^4d^2x^5\left(a+b\sin\right.$$

$$= \frac{8bd^2\sqrt{1-c^2x^2}}{15c}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{45c}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{25c}+d^2x\left(a+b\right.$$

Mathematica [A]
time = 0.06, size = 95, normalized size = 0.73

$$\frac{d^2\left(15acx(15-10c^2x^2+3c^4x^4)+b\sqrt{1-c^2x^2}\,(149-38c^2x^2+9c^4x^4)+15bcx(15-10c^2x^2+3c^4x^4)\,\mathrm{ArcSin}(cx)\right)}{225c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(149 - 3
8*c^2*x^2 + 9*c^4*x^4) + 15*b*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]
))/(225*c)
```

Maple [A]
time = 0.07, size = 122, normalized size = 0.93

method	result
derivativedivides	$\frac{d^2a\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{2c^3x^3\arcsin(cx)}{3}+cx\arcsin(cx)+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{38c^2x^2\sqrt{-c^2x\right.}{225}}{c}$

default	$\frac{d^2a\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{2c^3x^3\arcsin(cx)}{3}+cx\arcsin(cx)+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{38c^2x^2\sqrt{-c^2}}{225}\right.}{c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(d^2*a*(1/5*c^5*x^5-2/3*c^3*x^3+c*x)+d^2*b*(1/5*arcsin(c*x)*c^5*x^5-2/3
*c^3*x^3*arcsin(c*x)+c*x*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-38/225
*c^2*x^2*(-c^2*x^2+1)^(1/2)+149/225*(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.51, size = 196, normalized size = 1.50

$$\frac{1}{5}\,ac^4d^2x^5+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^4d^2-\frac{2}{3}\,ac^2d^2x^3-\frac{2}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^2d^2+ad^2x+\frac{\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bd^2}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*c^4*d^2*x^5 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^
2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^4*d^2 -
 2/3*a*c^2*d^2*x^3 - 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d^2 + a*d^2*x + (c*x*arcsin(c*x) + sqrt
(-c^2*x^2 + 1))*b*d^2/c
```

Fricas [A]
time = 3.22, size = 121, normalized size = 0.92

$$\frac{45\,ac^5d^2x^5-150\,ac^3d^2x^3+225\,acd^2x+15\,\left(3\,bc^5d^2x^5-10\,bc^3d^2x^3+15\,bcd^2x\right)\arcsin\left(cx\right)+\left(9\,bc^4d^2x^4-38\,bc^2d^2x^2+149\,bd^2\right)\sqrt{-c^2x^2+1}}{225\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*d^2*x^5 - 150*a*c^3*d^2*x^3 + 225*a*c*d^2*x + 15*(3*b*c^5*d
^2*x^5 - 10*b*c^3*d^2*x^3 + 15*b*c*d^2*x)*arcsin(c*x) + (9*b*c^4*d^2*x^4 -
38*b*c^2*d^2*x^2 + 149*b*d^2)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A]
time = 0.45, size = 165, normalized size = 1.26

$$\begin{cases}\frac{ac^4d^2x^5}{5}-\frac{2ac^2d^2x^3}{3}+ad^2x+\frac{bc^4d^2x^5\operatorname{asin}\left(cx\right)}{5}+\frac{bc^3d^2x^4\sqrt{-c^2x^2+1}}{25}-\frac{2bc^2d^2x^3\operatorname{asin}\left(cx\right)}{3}-\frac{38bcd^2x^2\sqrt{-c^2x^2+1}}{225}+bd^2x\operatorname{asin}\left(cx\right)+\frac{149bd^2\sqrt{-c^2x^2+1}}{225c} & \text{for}\ c\neq 0\\ ad^2x & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**5/5 - 2*a*c**2*d**2*x**3/3 + a*d**2*x + b*c**4*d*
*2*x**5*asin(c*x)/5 + b*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1)/25 - 2*b*c**2*d
**2*x**3*asin(c*x)/3 - 38*b*c*d**2*x**2*sqrt(-c**2*x**2 + 1)/225 + b*d**2*x
*asin(c*x) + 149*b*d**2*sqrt(-c**2*x**2 + 1)/(225*c), Ne(c, 0)), (a*d**2*x,
 True))
```

Giac [A]
time = 0.44, size = 158, normalized size = 1.21

$$\frac{1}{5}\,ac^4d^2x^5-\frac{2}{3}\,ac^2d^2x^3+\frac{1}{5}\,(c^2x^2-1)^2bd^2x\arcsin{(cx)}-\frac{4}{15}\,(c^2x^2-1)bd^2x\arcsin{(cx)}+\frac{8}{15}\,bd^2x\arcsin{(cx)}+\frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^2}{25\,c}+ad^2x+\frac{4\,(-c^2x^2+1)^{\frac{3}{2}}bd^2}{45\,c}+\frac{8\,\sqrt{-c^2x^2+1}\,bd^2}{15\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*c^4*d^2*x^5 - 2/3*a*c^2*d^2*x^3 + 1/5*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(
c*x) - 4/15*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x) + 8/15*b*d^2*x*arcsin(c*x) +
1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c + a*d^2*x + 4/45*(-c^2*x^2
+ 1)^(3/2)*b*d^2/c + 8/15*sqrt(-c^2*x^2 + 1)*b*d^2/c
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.15 $\int \frac{(d-c^2dx^2)^2(a+b\mathbf{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=184

$$-\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}-\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}-\frac{11}{32}bd^2\text{ArcSin}(cx)+\frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))+\frac{1}{4}d^2(1-$$

```
[Out] -1/16*b*c*d^2*x*(-c^2*x^2+1)^(3/2)-11/32*b*d^2*arcsin(c*x)+1/2*d^2*(-c^2*x^
2+1)*(a+b*arcsin(c*x))+1/4*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))-1/2*I*d^2*(
a+b*arcsin(c*x))^2/b+d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^
2)-1/2*I*b*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-11/32*b*c*d^2*x*(-c^
2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.14, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4773, 4721, 3798, 2221, 2317, 2438, 201, 222}

$$\frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))+\frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))-\frac{id^2(a+b\text{ArcSin}(cx))^2}{2b}+d^2\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{1}{2}ibd^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{11}{32}bd^2\text{ArcSin}(cx)-\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}-\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-11*b*c*d^2*x*Sqrt[1 - c^2*x^2])/32 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2))/16 -
 (11*b*d^2*ArcSin[c*x])/32 + (d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d
^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/4 - ((I/2)*d^2*(a + b*ArcSin[c*x])^
2)/b + d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d^2
*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2\,(a+b\sin^{-1}(cx))}{x}\,dx = \frac{1}{4}d^2(1-c^2x^2)^2\,(a+b\sin^{-1}(cx)) + d\int \frac{(d-c^2dx^2)\,(a+b\sin^{-1}(cx)}{x}$$

$$= -\frac{1}{16}bcd^2x(1-c^2x^2)^{3/2} + \frac{1}{2}d^2(1-c^2x^2)\,(a+b\sin^{-1}(cx)) + \frac{1}{4}d^2(1$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x(1-c^2x^2)^{3/2} + \frac{1}{2}d^2(1-c^2x^2)\,(a+$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x(1-c^2x^2)^{3/2} - \frac{11}{32}bd^2\sin^{-1}(cx) +$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x(1-c^2x^2)^{3/2} - \frac{11}{32}bd^2\sin^{-1}(cx) +$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x(1-c^2x^2)^{3/2} - \frac{11}{32}bd^2\sin^{-1}(cx) +$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x(1-c^2x^2)^{3/2} - \frac{11}{32}bd^2\sin^{-1}(cx) +$$

Mathematica [A]
time = 0.21, size = 166, normalized size = 0.90

$$\frac{1}{32}d^2\left(-32ac^2x^2+8ac^4x^4-13bcx\sqrt{1-c^2x^2}+2bc^3x^3\sqrt{1-c^2x^2}-16ib\text{ArcSin}(cx)^2+26b\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)+8b\text{ArcSin}(cx)\left(-4c^2x^2+c^4x^4+4\log\left(1-e^{2i\text{ArcSin}(cx)}\right)\right)+32a\log(x)-16ib\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (d^2*(-32*a*c^2*x^2 + 8*a*c^4*x^4 - 13*b*c*x*Sqrt[1 - c^2*x^2] + 2*b*c^3*x^
3*Sqrt[1 - c^2*x^2] - (16*I)*b*ArcSin[c*x]^2 + 26*b*ArcTan[(c*x)/(-1 + Sqrt
[1 - c^2*x^2])] + 8*b*ArcSin[c*x]*(-4*c^2*x^2 + c^4*x^4 + 4*Log[1 - E^((2*I
)*ArcSin[c*x])]) + 32*a*Log[x] - (16*I)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])]
))/32
```

Maple [A]
time = 0.21, size = 224, normalized size = 1.22

method	result
derivativedivides	$\frac{d^2 a\, c^4 x^4}{4} - d^2 a\, c^2 x^2 + d^2 a \ln(cx) - \frac{i b\, d^2 \arcsin(cx)^2}{2} + d^2 b \arcsin(cx) \ln\left(1 - icx - \sqrt{-c^2x^2}\right.$
default	$\frac{d^2 a\, c^4 x^4}{4} - d^2 a\, c^2 x^2 + d^2 a \ln(cx) - \frac{i b\, d^2 \arcsin(cx)^2}{2} + d^2 b \arcsin(cx) \ln\left(1 - icx - \sqrt{-c^2x^2}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*d^2*a*c^4*x^4-d^2*a*c^2*x^2+d^2*a*ln(c*x)-1/2*I*b*d^2*arcsin(c*x)^2+d^2
*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+d^2*b*arcsin(c*x)*ln(1+I*c*x+
(-c^2*x^2+1)^(1/2))-I*d^2*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d^2*b*po
lylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/32*d^2*b*arcsin(c*x)*cos(4*arcsin(c*x))
-1/128*d^2*b*sin(4*arcsin(c*x))+3/8*d^2*b*arcsin(c*x)*cos(2*arcsin(c*x))-3/
16*d^2*b*sin(2*arcsin(c*x))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/4*a*c^4*d^2*x^4 - a*c^2*d^2*x^2 + a*d^2*log(x) + integrate((b*c^4*d^2*x^4
 - 2*b*c^2*d^2*x^2 + b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x
)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))/x, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$d^{2}\left(\int \frac{a}{x}\, dx + \int \left(-2ac^{2}x\right)\, dx + \int ac^{4}x^{3}\, dx + \int \frac{b\operatorname{asin}{\left(cx \right)}}{x}\, dx + \int \left(-2bc^{2}x\operatorname{asin}{\left(cx \right)}\right)\, dx + \int bc^{4}x^{3}\operatorname{asin}{\left(cx \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x,x)
```

```
[Out] d**2*(Integral(a/x, x) + Integral(-2*a*c**2*x, x) + Integral(a*c**4*x**3, x
) + Integral(b*asin(c*x)/x, x) + Integral(-2*b*c**2*x*asin(c*x), x) + Integ
ral(b*c**4*x**3*asin(c*x), x))
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)/x, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x, x)
```

3.16 $\int \frac{(d-c^2dx^2)^2(a+b\text{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=123

$$-\frac{5}{3}bcd^2\sqrt{1-c^2x^2}-\frac{1}{9}bcd^2(1-c^2x^2)^{3/2}-\frac{d^2(a+b\text{ArcSin}(cx))}{x}-2c^2d^2x(a+b\text{ArcSin}(cx))+\frac{1}{3}c^4d^2x^3(a+b\text{ArcSi}$$

```
[Out] -1/9*b*c*d^2*(-c^2*x^2+1)^(3/2)-d^2*(a+b*arcsin(c*x))/x-2*c^2*d^2*x*(a+b*ar
csin(c*x))+1/3*c^4*d^2*x^3*(a+b*arcsin(c*x))-b*c*d^2*arctanh((-c^2*x^2+1)^(
1/2))-5/3*b*c*d^2*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {276, 4777, 12, 1265, 911, 1167, 214}

$$\frac{1}{3}c^4d^2x^3(a+b\text{ArcSin}(cx))-2c^2d^2x(a+b\text{ArcSin}(cx))-\frac{d^2(a+b\text{ArcSin}(cx))}{x}-\frac{1}{9}bcd^2(1-c^2x^2)^{3/2}-\frac{5}{3}bcd^2\sqrt{1-c^2x^2}-bcd^2\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-5*b*c*d^2*Sqrt[1 - c^2*x^2])/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2))/9 - (d^2*(
a + b*ArcSin[c*x]))/x - 2*c^2*d^2*x*(a + b*ArcSin[c*x]) + (c^4*d^2*x^3*(a +
 b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
```

```
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx))}{x^2}\,dx = -\frac{d^2(a+b\sin^{-1}(cx))}{x} - 2c^2d^2x(a+b\sin^{-1}(cx)) + \frac{1}{3}c^4d^2x^3(a+b\sin^{-}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{x} - 2c^2d^2x(a+b\sin^{-1}(cx)) + \frac{1}{3}c^4d^2x^3(a+b\sin^{-}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{x} - 2c^2d^2x(a+b\sin^{-1}(cx)) + \frac{1}{3}c^4d^2x^3(a+b\sin^{-}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{x} - 2c^2d^2x(a+b\sin^{-1}(cx)) + \frac{1}{3}c^4d^2x^3(a+b\sin^{-}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{x} - 2c^2d^2x(a+b\sin^{-1}(cx)) + \frac{1}{3}c^4d^2x^3(a+b\sin^{-}$$

$$= -\frac{5}{3}bcd^2\sqrt{1-c^2x^2} - \frac{1}{9}bcd^2(1-c^2x^2)^{3/2} - \frac{d^2(a+b\sin^{-1}(cx))}{x} - 2c^2$$

$$= -\frac{5}{3}bcd^2\sqrt{1-c^2x^2} - \frac{1}{9}bcd^2(1-c^2x^2)^{3/2} - \frac{d^2(a+b\sin^{-1}(cx))}{x} - 2c^2$$

Mathematica [A]
time = 0.06, size = 126, normalized size = 1.02

$$\frac{d^2\left(-9a-18ac^2x^2+3ac^4x^4-16bcx\sqrt{1-c^2x^2}+bc^3x^3\sqrt{1-c^2x^2}+3b(-3-6c^2x^2+c^4x^4)\operatorname{ArcSin}(cx)+9bcx\log(x)-9bcx\log\left(1+\sqrt{1-c^2x^2}\right)\right)}{9x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (d^2*(-9*a - 18*a*c^2*x^2 + 3*a*c^4*x^4 - 16*b*c*x*Sqrt[1 - c^2*x^2] + b*c^
3*x^3*Sqrt[1 - c^2*x^2] + 3*b*(-3 - 6*c^2*x^2 + c^4*x^4)*ArcSin[c*x] + 9*b*
c*x*Log[x] - 9*b*c*x*Log[1 + Sqrt[1 - c^2*x^2]]))/(9*x)
```

Maple [A]
time = 0.07, size = 117, normalized size = 0.95

method	result
derivativedivides	$c\left(d^2a\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)+d^2b\left(\frac{c^3x^3\arcsin(cx)}{3}-2cx\arcsin(cx)-\frac{\arcsin(cx)}{cx}+\frac{c^2x^2\sqrt{-c^2x^2}}{9}\right.\right.$
default	$c\left(d^2a\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)+d^2b\left(\frac{c^3x^3\arcsin(cx)}{3}-2cx\arcsin(cx)-\frac{\arcsin(cx)}{cx}+\frac{c^2x^2\sqrt{-c^2x^2}}{9}\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(d^2*a*(1/3*c^3*x^3-2*c*x-1/c/x)+d^2*b*(1/3*c^3*x^3*arcsin(c*x)-2*c*x*arc
sin(c*x)-1/c/x*arcsin(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/9*(-c^2*x^2+1)
^(1/2)-arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.50, size = 160, normalized size = 1.30

$$\frac{1}{3}\,ac^4d^2x^3+\frac{1}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^4d^2-2\,ac^2d^2x-2\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bcd^2-\left(c\log\left(\frac{2\,\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin\left(cx\right)}{x}\right)bd^2-\frac{ad^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*c^4*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
+ 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^4*d^2 - 2*a*c^2*d^2*x - 2*(c*x*arcsin(c*x)
 + sqrt(-c^2*x^2 + 1))*b*c*d^2 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs
(x)) + arcsin(c*x)/x)*b*d^2 - a*d^2/x
```

Fricas [A]
time = 2.81, size = 152, normalized size = 1.24

$$\frac{6\,ac^4d^2x^4-36\,ac^2d^2x^2-9\,bcd^2x\log\left(\sqrt{-c^2x^2+1}+1\right)+9\,bcd^2x\log\left(\sqrt{-c^2x^2+1}-1\right)-18\,ad^2+6\,(bc^4d^2x^4-6\,bc^2d^2x^2-3\,bd^2)\arcsin\left(cx\right)+2\,(bc^3d^2x^3-16\,bcd^2x)\sqrt{-c^2x^2+1}}{18\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/18*(6*a*c^4*d^2*x^4 - 36*a*c^2*d^2*x^2 - 9*b*c*d^2*x*log(sqrt(-c^2*x^2 +
1) + 1) + 9*b*c*d^2*x*log(sqrt(-c^2*x^2 + 1) - 1) - 18*a*d^2 + 6*(b*c^4*d^2
*x^4 - 6*b*c^2*d^2*x^2 - 3*b*d^2)*arcsin(c*x) + 2*(b*c^3*d^2*x^3 - 16*b*c*d
^2*x)*sqrt(-c^2*x^2 + 1))/x
```

Sympy [A]
time = 3.61, size = 182, normalized size = 1.48

$$\frac{ac^4d^2x^3}{3}-2ac^2d^2x-\frac{ad^2}{x}-\frac{bc^5d^2\left(\begin{cases}-\frac{x^2\sqrt{-c^2x^2+1}}{3c^2}-\frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c\neq 0\\ \frac{x^4}{4} & \text{otherwise}\end{cases}\right)}{3}+\frac{bc^4d^2x^3\operatorname{asin}\left(cx\right)}{3}-2bc^2d^2\left(\begin{cases}0 & \text{for}\ c=0\\ x\operatorname{asin}\left(cx\right)+\frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right)+bcd^2\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)-\frac{bd^2\operatorname{asin}\left(cx\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**2,x)
```

```
[Out] a*c**4*d**2*x**3/3 - 2*a*c**2*d**2*x - a*d**2/x - b*c**5*d**2*Piecewise((-x
**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c,
0)), (x**4/4, True))/3 + b*c**4*d**2*x**3*asin(c*x)/3 - 2*b*c**2*d**2*Piece
wise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*c*d**
2*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True
)) - b*d**2*asin(c*x)/x
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2717 vs. $2(111) = 222$.
time = 6.29, size = 2717, normalized size = 22.09

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^9*d^2*x^8*arcsin(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/2*a*c^9*d^2*x^8
/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^
5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^8) + b*c^8*d^2*x^7*log(abs(c)*abs(x))/((c^7*x^7/(sqr
t(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(
sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^7) - b*c^8*d^2*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^7) + 16/9*b*c^8*d^2*x^7/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sq
rt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) - 6*b*c^7*d^2*x^6*arcsin
(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1)
+ 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 6*a*c^7*d^2*x^6/((c^7*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^
2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) +
 3*b*c^6*d^2*x^5*log(abs(c)*abs(x))/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 +
3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^6*d^2*
x^5*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) + 4/3*b*c^6*d^2*x^
5/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)
^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(
sqrt(-c^2*x^2 + 1) + 1)^5) - 25/3*b*c^5*d^2*x^4*arcsin(c*x)/((c^7*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1
) + 1)^4) - 25/3*a*c^5*d^2*x^4/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 3*b*c^4*d^2*x^3*l
og(abs(c)*abs(x))/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^4*d^2*x^3*log(sqrt(-c^2*
```

```
x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2
+ 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 4/3*b*c^4*d^2*x^3/((c^7*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
 + 1)^3) - 6*b*c^3*d^2*x^2*arcsin(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1
)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 6*a*c^3*d
^2*x^2/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^2*d^2*x*log(abs(c)*abs(x))/((c^7*x^7/
(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x
^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1)) - b*c^2*d^2*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)) - 16/9*b*c^2*d^2*x/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d^2*arcsin(c*x)/(c^7
*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*
c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*a*
c*d^2/(c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)
)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\begin{cases} b\,c^4\,d^2\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}(c\,x)}{3}\right)-\frac{a\,d^2\,\left(-c^4\,x^4+6\,c^2\,x^2+3\right)}{3\,x}-2\,b\,c\,d^2\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)-b\,c\,d^2\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^2}}\right)-\frac{b\,d^2\,\mathrm{asin}(c\,x)}{x} & \text{if } 0<c \\ \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2}{x^2}\,dx & \text{if } \neg 0<c \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^2,x)
```

```
[Out] piecewise(0 < c, - b*c*d^2*atanh(1/(- c^2*x^2 + 1)^(1/2)) - (a*d^2*(6*c^2*x
^2 - c^4*x^4 + 3))/(3*x) - 2*b*c*d^2*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)
) + b*c^4*d^2*(((1/c^2 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x))/3) -
 (b*d^2*asin(c*x))/x, ~0 < c, int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^2
, x))
```

3.17 $\int \frac{(d-c^2dx^2)^2(a+b\text{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=201

$$-\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2}-\frac{bcd^2(1-c^2x^2)^{3/2}}{2x}-\frac{1}{4}bc^2d^2\text{ArcSin}(cx)-c^2d^2(1-c^2x^2)(a+b\text{ArcSin}(cx))-\frac{d^2(1-c^2x^2)}{}$$

```
[Out] -1/2*b*c*d^2*(-c^2*x^2+1)^(3/2)/x-1/4*b*c^2*d^2*arcsin(c*x)-c^2*d^2*(-c^2*x
^2+1)*(a+b*arcsin(c*x))-1/2*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/x^2+I*c^2*
d^2*(a+b*arcsin(c*x))^2/b-2*c^2*d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)+I*b*c^2*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/4*b*c^3
*d^2*x*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4775, 283, 201, 222, 4773, 4721, 3798, 2221, 2317, 2438}

$$-c^2d^2(1-c^2x^2)(a+b\text{ArcSin}(cx))-\frac{d^2(1-c^2x^2)^2(a+b\text{ArcSin}(cx))}{2x^2}+\frac{ic^2d^2(a+b\text{ArcSin}(cx))^2}{b}-2c^2d^2\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))+ibc^2d^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{4}bc^2d^2\text{ArcSin}(cx)-\frac{bcd^2(1-c^2x^2)^{3/2}}{2x}-\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/4*(b*c^3*d^2*x*Sqrt[1 - c^2*x^2]) - (b*c*d^2*(1 - c^2*x^2)^(3/2))/(2*x)
- (b*c^2*d^2*ArcSin[c*x])/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]) - (
d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*x^2) + (I*c^2*d^2*(a + b*ArcSin
[c*x])^2)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])]
+ I*b*c^2*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
```

```
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
```

```
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2\,(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d^2(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))}{2x^2} - (2c^2d)\int \frac{(d-c^2dx^2)\,(a+b\sin^{-1}(}{x}$$

$$= -\frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - c^2d^2(1-c^2x^2)\,(a+b\sin^{-1}(cx)) - \frac{d^2(1-c^2x^2}{}$$

$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - c^2d^2(1-c^2x^2)\,(a+b\sin$$

$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2($$

$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2($$

$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2($$

$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\sin^{-1}(cx) - c^2d^2($$

Mathematica [A]
time = 0.12, size = 185, normalized size = 0.92

$$\frac{d^2\left(-2a+2ac^4x^4-2bcx\sqrt{1-c^2x^2}+bc^3x^3\sqrt{1-c^2x^2}+4ibc^2x^2\mathrm{ArcSin}(cx)^2-2bc^2x^2\mathrm{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)+2b\mathrm{ArcSin}(cx)\left(-1+c^4x^4-4c^2x^2\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)\right)-8ac^2x^2\log(x)+4ibc^2x^2\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (d^2*(-2*a + 2*a*c^4*x^4 - 2*b*c*x*Sqrt[1 - c^2*x^2] + b*c^3*x^3*Sqrt[1 - c
^2*x^2] + (4*I)*b*c^2*x^2*ArcSin[c*x]^2 - 2*b*c^2*x^2*ArcTan[(c*x)/(-1 + Sq
rt[1 - c^2*x^2])] + 2*b*ArcSin[c*x]*(-1 + c^4*x^4 - 4*c^2*x^2*Log[1 - E^((2
*I)*ArcSin[c*x])]) - 8*a*c^2*x^2*Log[x] + (4*I)*b*c^2*x^2*PolyLog[2, E^((2*
I)*ArcSin[c*x])]))/(4*x^2)
```

Maple [A]
time = 0.41, size = 264, normalized size = 1.31

method	result
derivativedivides	$c^2\left(\frac{d^2 a\, c^2 x^2}{2} - \frac{d^2 a}{2c^2 x^2} - 2d^2 a \ln(cx) + ib\, d^2 \arcsin(cx)^2 + \frac{bc\, d^2 x \sqrt{-c^2x^2+1}}{4} + \frac{d^2 b \arcsin(cx)c}{2}\right.$
default	$c^2\left(\frac{d^2 a\, c^2 x^2}{2} - \frac{d^2 a}{2c^2 x^2} - 2d^2 a \ln(cx) + ib\, d^2 \arcsin(cx)^2 + \frac{bc\, d^2 x \sqrt{-c^2x^2+1}}{4} + \frac{d^2 b \arcsin(cx)c}{2}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(1/2*d^2*a*c^2*x^2-1/2*d^2*a/c^2/x^2-2*d^2*a*ln(c*x)+I*d^2*b*arcsin(c*x
)^2+1/4*b*c*d^2*x*(-c^2*x^2+1)^(1/2)+1/2*d^2*b*arcsin(c*x)*c^2*x^2-1/4*b*d^
2*arcsin(c*x)+1/2*I*d^2*b-1/2*d^2*b/c/x*(-c^2*x^2+1)^(1/2)-1/2*d^2*b*arcsin
(c*x)/c^2/x^2-2*d^2*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*d^2*b*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*d^2*b*polylog(2,-I*c*x-(-c^2*x
^2+1)^(1/2))+2*I*d^2*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*c^4*d^2*x^2 - 2*a*c^2*d^2*log(x) - 1/2*b*d^2*(sqrt(-c^2*x^2 + 1)*c/x
+ arcsin(c*x)/x^2) - 1/2*a*d^2/x^2 + integrate((b*c^4*d^2*x^2 - 2*b*c^2*d^2
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^2\left(\int \frac{a}{x^3}\,dx + \int\left(-\frac{2ac^2}{x}\right)dx + \int ac^4x\,dx + \int \frac{b\operatorname{asin}(cx)}{x^3}\,dx + \int\left(-\frac{2bc^2\operatorname{asin}(cx)}{x}\right)dx + \int bc^4x\operatorname{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**3,x)
```

```
[Out] d**2*(Integral(a/x**3, x) + Integral(-2*a*c**2/x, x) + Integral(a*c**4*x, x
) + Integral(b*asin(c*x)/x**3, x) + Integral(-2*b*c**2*asin(c*x)/x, x) + In
tegral(b*c**4*x*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^3, x)
```

3.18 $\int \frac{(d-c^2dx^2)^2(a+b\mathbf{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=128

$$bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2(a+b\text{ArcSin}(cx))}{3x^3}+\frac{2c^2d^2(a+b\text{ArcSin}(cx))}{x}+c^4d^2x(a+b\text{ArcSin}(cx))$$

```
[Out] -1/3*d^2*(a+b*arcsin(c*x))/x^3+2*c^2*d^2*(a+b*arcsin(c*x))/x+c^4*d^2*x*(a+b
*arcsin(c*x))+11/6*b*c^3*d^2*arctanh((-c^2*x^2+1)^(1/2))+b*c^3*d^2*(-c^2*x^
2+1)^(1/2)-1/6*b*c*d^2*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.11, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {276, 4777, 12, 1265, 911, 1171, 396, 214}

$$c^4d^2x(a+b\text{ArcSin}(cx))+\frac{2c^2d^2(a+b\text{ArcSin}(cx))}{x}-\frac{d^2(a+b\text{ArcSin}(cx))}{3x^3}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}+bc^3d^2\sqrt{1-c^2x^2}+\frac{11}{6}bc^3d^2\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] b*c^3*d^2*Sqrt[1 - c^2*x^2] - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) + (2*c^2*d^2*(a + b*ArcSin[c*x]))/x + c^4*d^2*x*
(a + b*ArcSin[c*x]) + (11*b*c^3*d^2*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
```

```
c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1171

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, Simp[(-R)*x*((d + e*x^2)^(q + 1)/(2*d*(q + 1))), x] + Dist[1/(2*d*(q
 + 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x
], x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2
 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx))}{x^4}\,dx = -\frac{d^2(a+b\sin^{-1}(cx))}{3x^3}+\frac{2c^2d^2(a+b\sin^{-1}(cx))}{x}+c^4d^2x(a+b\sin^{-1}($$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{3x^3}+\frac{2c^2d^2(a+b\sin^{-1}(cx))}{x}+c^4d^2x(a+b\sin^{-1}($$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{3x^3}+\frac{2c^2d^2(a+b\sin^{-1}(cx))}{x}+c^4d^2x(a+b\sin^{-1}($$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{3x^3}+\frac{2c^2d^2(a+b\sin^{-1}(cx))}{x}+c^4d^2x(a+b\sin^{-1}($$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2(a+b\sin^{-1}(cx))}{3x^3}+\frac{2c^2d^2(a+b\sin^{-1}(cx))}{x}+$$

$$= bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2(a+b\sin^{-1}(cx))}{3x^3}+\frac{2c^2d^2(a}{}$$

$$= bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2(a+b\sin^{-1}(cx))}{3x^3}+\frac{2c^2d^2(a}{}$$

Mathematica [A]
time = 0.06, size = 136, normalized size = 1.06

$$\frac{d^2\left(-2a+12ac^2x^2+6ac^4x^4-bcx\sqrt{1-c^2x^2}+6bc^3x^3\sqrt{1-c^2x^2}+2b(-1+6c^2x^2+3c^4x^4)\,\mathrm{ArcSin}(cx)-11bc^3x^3\log(x)+11bc^3x^3\log\left(1+\sqrt{1-c^2x^2}\right)\right)}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
[Out] (d^2*(-2*a + 12*a*c^2*x^2 + 6*a*c^4*x^4 - b*c*x*Sqrt[1 - c^2*x^2] + 6*b*c^3
*x^3*Sqrt[1 - c^2*x^2] + 2*b*(-1 + 6*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x] - 11*
b*c^3*x^3*Log[x] + 11*b*c^3*x^3*Log[1 + Sqrt[1 - c^2*x^2]]))/(6*x^3)
```

Maple [A]
time = 0.07, size = 115, normalized size = 0.90

method	result
derivativedivides	$c^3\Bigg(d^2a\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+d^2b\Bigg(cx\arcsin(cx)-\frac{\arcsin(cx)}{3c^3x^3}+\frac{2\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}$

default	$c^3\left(d^2a\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+d^2b\left(cx\arcsin\left(cx\right)-\frac{\arcsin(cx)}{3c^3x^3}+\frac{2\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}-\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(d^2*a*(c*x-1/3/c^3/x^3+2/c/x)+d^2*b*(c*x*arcsin(c*x)-1/3/c^3/x^3*arcsi
n(c*x)+2/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)-1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)+
11/6*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.49, size = 170, normalized size = 1.33

$$ac^4d^2x+\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bc^3d^2+2\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin\left(cx\right)}{x}\right)bc^2d^2-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin\left(cx\right)}{x^3}\right)bd^2+\frac{2ac^2d^2}{x}-\frac{ad^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] a*c^4*d^2*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*c^3*d^2 + 2*(c*log(2
*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*c^2*d^2 - 1/6*((c
^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c
+ 2*arcsin(c*x)/x^3)*b*d^2 + 2*a*c^2*d^2/x - 1/3*a*d^2/x^3
```

Fricas [A]
time = 2.98, size = 162, normalized size = 1.27

$$\frac{12\,ac^4d^2x^4+11\,bc^3d^2x^3\log\left(\sqrt{-c^2x^2+1}+1\right)-11\,bc^3d^2x^3\log\left(\sqrt{-c^2x^2+1}-1\right)+24\,ac^2d^2x^2-4\,ad^2+4\,(3\,bc^4d^2x^4+6\,bc^2d^2x^2-bd^2)\arcsin\left(cx\right)+2\,(6\,bc^3d^2x^3-bcd^2x)\sqrt{-c^2x^2+1}}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(12*a*c^4*d^2*x^4 + 11*b*c^3*d^2*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - 11*
b*c^3*d^2*x^3*log(sqrt(-c^2*x^2 + 1) - 1) + 24*a*c^2*d^2*x^2 - 4*a*d^2 + 4*
(3*b*c^4*d^2*x^4 + 6*b*c^2*d^2*x^2 - b*d^2)*arcsin(c*x) + 2*(6*b*c^3*d^2*x^
3 - b*c*d^2*x)*sqrt(-c^2*x^2 + 1))/x^3
```

Sympy [A]
time = 4.38, size = 233, normalized size = 1.82

$$ac^4d^2x+\frac{2ac^2d^2}{x}-\frac{ad^2}{3x^3}+bc^4d^2\left(\begin{cases}0 & \text{for}\ c=0\\ x\,\text{asin}\left(cx\right)+\frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right)-2bc^3d^2\left(\begin{cases}-\text{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|}>1\\ i\,\text{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)+\frac{2bc^2d^2\,\text{asin}\left(cx\right)}{x}+\frac{bcd^2\left(\begin{cases}-\frac{c^2\,\text{acosh}\left(\frac{1}{cx}\right)}{2}+\frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}}-\frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for}\ \frac{1}{|c^2x^2|}>1\\ \frac{ic^2\,\text{asin}\left(\frac{1}{cx}\right)}{2}-\frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise}\end{cases}\right)}{3}-\frac{bd^2\,\text{asin}\left(cx\right)}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**4,x)
```

```
[Out] a*c**4*d**2*x + 2*a*c**2*d**2/x - a*d**2/(3*x**3) + b*c**4*d**2*Piecewise((
0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) - 2*b*c**3*d**2
*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)
) + 2*b*c**2*d**2*asin(c*x)/x + b*c*d**2*Piecewise((-c**2*acosh(1/(c*x))/2
+ c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**3*sqrt(-1 + 1/(c**2*x**2))),
 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c*sqrt(1 - 1/(c**2*x**2
))/(2*x), True))/3 - b*d**2*asin(c*x)/(3*x**3)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1409 vs. $2(116) = 232$.
time = 58.26, size = 1409, normalized size = 11.01

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^11*d^2*x^8*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/24*a*c^11*
d^2*x^8/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) + 1/24*b*c^10*d^2*x^7/((c^5*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
1) + 1)^7) + 5/6*b*c^9*d^2*x^6*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) + 5/
6*a*c^9*d^2*x^6/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 11/6*b*c^8*d^2*x^5*log(abs(c)
*abs(x))/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 11/6*b*c^8*d^2*x^5*log(sqrt(-c^2*x^2
 + 1) + 1)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 23/24*b*c^8*d^2*x^5/((c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^5) + 15/4*b*c^7*d^2*x^4*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2 + 1
) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4)
+ 15/4*a*c^7*d^2*x^4/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 11/6*b*c^6*d^2*x^3*log(a
bs(c)*abs(x))/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2
 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 11/6*b*c^6*d^2*x^3*log(sqrt(-c^
2*x^2 + 1) + 1)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 23/24*b*c^6*d^2*x^3/((c^5*x^5
/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^
2*x^2 + 1) + 1)^3) + 5/6*b*c^5*d^2*x^2*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2
 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)
^2) + 5/6*a*c^5*d^2*x^2/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqr
t(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) - 1/24*b*c^4*d^2*x/((c^
```

```
5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqr
t(-c^2*x^2 + 1) + 1)) - 1/24*b*c^3*d^2*arcsin(c*x)/(c^5*x^5/(sqrt(-c^2*x^2
+ 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3) - 1/24*a*c^3*d^2/(c^5*x^5
/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^4, x)
```

3.19 $\int x^4(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=232

$$\frac{16bd^3\sqrt{1-c^2x^2}}{1155c^5}+\frac{8bd^3(1-c^2x^2)^{3/2}}{3465c^5}+\frac{2bd^3(1-c^2x^2)^{5/2}}{1925c^5}+\frac{bd^3(1-c^2x^2)^{7/2}}{1617c^5}-\frac{4bd^3(1-c^2x^2)^{9/2}}{297c^5}+\frac{bd^3(1-c^2x^2)}{121c^5}$$

```
[Out] 8/3465*b*d^3*(-c^2*x^2+1)^(3/2)/c^5+2/1925*b*d^3*(-c^2*x^2+1)^(5/2)/c^5+1/1
617*b*d^3*(-c^2*x^2+1)^(7/2)/c^5-4/297*b*d^3*(-c^2*x^2+1)^(9/2)/c^5+1/121*b
*d^3*(-c^2*x^2+1)^(11/2)/c^5+1/5*d^3*x^5*(a+b*arcsin(c*x))-3/7*c^2*d^3*x^7*
(a+b*arcsin(c*x))+1/3*c^4*d^3*x^9*(a+b*arcsin(c*x))-1/11*c^6*d^3*x^11*(a+b*
arcsin(c*x))+16/1155*b*d^3*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A]
time = 0.21, antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {276, 4777, 12, 1813, 1634}

$$-\frac{1}{11}c^6d^3x^{11}(a+b\text{ArcSin}(cx))+\frac{1}{3}c^4d^3x^9(a+b\text{ArcSin}(cx))-\frac{3}{7}c^2d^3x^7(a+b\text{ArcSin}(cx))+\frac{1}{5}d^3x^5(a+b\text{ArcSin}(cx))+\frac{bd^3(1-c^2x^2)^{11/2}}{121c^5}-\frac{4bd^3(1-c^2x^2)^{9/2}}{297c^5}+\frac{bd^3(1-c^2x^2)^{7/2}}{1617c^5}+\frac{2bd^3(1-c^2x^2)^{5/2}}{1925c^5}+\frac{8bd^3(1-c^2x^2)^{3/2}}{3465c^5}+\frac{16bd^3\sqrt{1-c^2x^2}}{1155c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(1155*c^5) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(34
65*c^5) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(1925*c^5) + (b*d^3*(1 - c^2*x^2)^(
7/2))/(1617*c^5) - (4*b*d^3*(1 - c^2*x^2)^(9/2))/(297*c^5) + (b*d^3*(1 - c^
2*x^2)^(11/2))/(121*c^5) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 - (3*c^2*d^3*x^7
*(a + b*ArcSin[c*x]))/7 + (c^4*d^3*x^9*(a + b*ArcSin[c*x]))/3 - (c^6*d^3*x^
11*(a + b*ArcSin[c*x]))/11
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
```

```
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+\right.$$

$$= \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+\right.$$

$$= \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+\right.$$

$$= \frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)-\frac{3}{7}c^2d^3x^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}c^4d^3x^9\left(a+\right.$$

$$= \frac{16bd^3\sqrt{1-c^2x^2}}{1155c^5}+\frac{8bd^3\left(1-c^2x^2\right)^{3/2}}{3465c^5}+\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{1925c^5}+\frac{bd^3(1}{}$$

Mathematica [A]
time = 0.12, size = 143, normalized size = 0.62

$$\frac{d^3\left(-3465ac^5x^5\left(-231+495c^2x^2-385c^4x^4+105c^6x^6\right)+b\sqrt{1-c^2x^2}\left(50488+25244c^2x^2+18933c^4x^4-117625c^6x^6+111475c^8x^8-33075c^{10}x^{10}\right)-3465bc^5x^5\left(-231+495c^2x^2-385c^4x^4+105c^6x^6\right)\mathrm{ArcSin}(cx)\right)}{4002075c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-3465*a*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4 + 105*c^6*x^6) + b*
Sqrt[1 - c^2*x^2]*(50488 + 25244*c^2*x^2 + 18933*c^4*x^4 - 117625*c^6*x^6 +
```

```
111475*c^8*x^8 - 33075*c^10*x^10) - 3465*b*c^5*x^5*(-231 + 495*c^2*x^2 - 3
85*c^4*x^4 + 105*c^6*x^6)*ArcSin[c*x]))/(4002075*c^5)
```

Maple [A]
time = 0.07, size = 214, normalized size = 0.92

method	result
derivativedivides	$-d^3a\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b\left(\frac{\arcsin(cx)c^{11}x^{11}}{11}-\frac{\arcsin(cx)c^9x^9}{3}+\frac{3\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^{10}}{}\right.$
default	$-d^3a\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b\left(\frac{\arcsin(cx)c^{11}x^{11}}{11}-\frac{\arcsin(cx)c^9x^9}{3}+\frac{3\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^{10}}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-d^3*a*(1/11*c^11*x^11-1/3*c^9*x^9+3/7*c^7*x^7-1/5*c^5*x^5)-d^3*b*(1
/11*arcsin(c*x)*c^11*x^11-1/3*arcsin(c*x)*c^9*x^9+3/7*arcsin(c*x)*c^7*x^7-1
/5*arcsin(c*x)*c^5*x^5+1/121*c^10*x^10*(-c^2*x^2+1)^(1/2)-91/3267*c^8*x^8*(
-c^2*x^2+1)^(1/2)+4705/160083*c^6*x^6*(-c^2*x^2+1)^(1/2)-6311/1334025*c^4*x
^4*(-c^2*x^2+1)^(1/2)-25244/4002075*c^2*x^2*(-c^2*x^2+1)^(1/2)-50488/400207
5*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 479 vs. $2(200) = 400$.
time = 0.50, size = 479, normalized size = 2.06

$$-\frac{1}{11}ac^6d^3x^{11}+\frac{1}{3}ac^4d^3x^9-\frac{3}{7}ac^2d^3x^7-\frac{1}{7623}\left(693x^{11}\arcsin(cx)+\left(\frac{63\sqrt{-c^2x^2+1}x^{10}}{c^2}+\frac{70\sqrt{-c^2x^2+1}x^8}{c^4}+\frac{80\sqrt{-c^2x^2+1}x^6}{c^6}+\frac{96\sqrt{-c^2x^2+1}x^4}{c^8}+\frac{128\sqrt{-c^2x^2+1}x^2}{c^{10}}+\frac{256\sqrt{-c^2x^2+1}}{c^{12}}\right)c\right)bc^6d^3+\frac{1}{945}\left(315x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right)bc^4d^3+\frac{1}{5}ad^3x^5-\frac{3}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bc^2d^3+\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/11*a*c^6*d^3*x^11 + 1/3*a*c^4*d^3*x^9 - 3/7*a*c^2*d^3*x^7 - 1/7623*(693*
x^11*arcsin(c*x) + (63*sqrt(-c^2*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*
x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 1
28*sqrt(-c^2*x^2 + 1)*x^2/c^10 + 256*sqrt(-c^2*x^2 + 1)/c^12)*c)*b*c^6*d^3
+ 1/945*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^
2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*
x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*c^4*d^3 + 1/5*a*d^3*x^5 - 3/245
*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)
*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c
^2*d^3 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^3
```

Fricas [A]
time = 2.51, size = 189, normalized size = 0.81

$$-\frac{363825\,ac^{11}d^3x^{11}-1334025\,ac^9d^3x^9+1715175\,ac^7d^3x^7-800415\,ac^5d^3x^5+3465\,(105\,bc^{11}d^3x^{11}-385\,bc^9d^3x^9+495\,bc^7d^3x^7-231\,bc^5d^3x^5)\arcsin(cx)+(33075\,bc^{10}d^3x^{10}-111475\,bc^8d^3x^8+117625\,bc^6d^3x^6-18933\,bc^4d^3x^4-25244\,bc^2d^3x^2-50488\,bd^3)\sqrt{-c^2x^2+1}}{4002075\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/4002075*(363825*a*c^11*d^3*x^11 - 1334025*a*c^9*d^3*x^9 + 1715175*a*c^7*
d^3*x^7 - 800415*a*c^5*d^3*x^5 + 3465*(105*b*c^11*d^3*x^11 - 385*b*c^9*d^3*
x^9 + 495*b*c^7*d^3*x^7 - 231*b*c^5*d^3*x^5)*arcsin(c*x) + (33075*b*c^10*d^
3*x^10 - 111475*b*c^8*d^3*x^8 + 117625*b*c^6*d^3*x^6 - 18933*b*c^4*d^3*x^4
- 25244*b*c^2*d^3*x^2 - 50488*b*d^3)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 2.97, size = 289, normalized size = 1.25

$$\begin{cases} - \frac{a c^{6} d^{3} x^{11}}{11} + \frac{a c^{4} d^{3} x^{9}}{3} - \frac{3 a c^{2} d^{3} x^{7}}{7} + \frac{a d^{3} x^{5}}{5} - \frac{b c^{6} d^{3} x^{11} \operatorname{asin}{\left(c x \right)}}{11} - \frac{b c^{5} d^{3} x^{10} \sqrt{- c^{2} x^{2} + 1}}{121} + \frac{b c^{4} d^{3} x^{9} \operatorname{asin}{\left(c x \right)}}{3} + \frac{91 b c^{3} d^{3} x^{8} \sqrt{- c^{2} x^{2} + 1}}{3267} - \frac{3 b c^{2} d^{3} x^{7} \operatorname{asin}{\left(c x \right)}}{7} - \frac{4705 b c d^{3} x^{6} \sqrt{- c^{2} x^{2} + 1}}{160083} + \frac{b d^{3} x^{5} \operatorname{asin}{\left(c x \right)}}{5} + \frac{6311 b d^{3} x^{4} \sqrt{- c^{2} x^{2} + 1}}{1334025 c} + \frac{25244 b d^{3} x^{2} \sqrt{- c^{2} x^{2} + 1}}{4002075 c^{3}} + \frac{50488 b d^{3} \sqrt{- c^{2} x^{2} + 1}}{4002075 c^{5}} & \text{for}\: c \neq 0 \\ \frac{a d^{3} x^{5}}{5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**11/11 + a*c**4*d**3*x**9/3 - 3*a*c**2*d**3*x**7/
7 + a*d**3*x**5/5 - b*c**6*d**3*x**11*asin(c*x)/11 - b*c**5*d**3*x**10*sqrt
(-c**2*x**2 + 1)/121 + b*c**4*d**3*x**9*asin(c*x)/3 + 91*b*c**3*d**3*x**8*s
qrt(-c**2*x**2 + 1)/3267 - 3*b*c**2*d**3*x**7*asin(c*x)/7 - 4705*b*c*d**3*x
**6*sqrt(-c**2*x**2 + 1)/160083 + b*d**3*x**5*asin(c*x)/5 + 6311*b*d**3*x**
4*sqrt(-c**2*x**2 + 1)/(1334025*c) + 25244*b*d**3*x**2*sqrt(-c**2*x**2 + 1)
/(4002075*c**3) + 50488*b*d**3*sqrt(-c**2*x**2 + 1)/(4002075*c**5), Ne(c, 0
)), (a*d**3*x**5/5, True))
```

Giac [A]
time = 0.41, size = 353, normalized size = 1.52

$$-\frac{1}{11} \, a c^{6} d^{3} x^{11} + \frac{1}{3} \, a c^{4} d^{3} x^{9} - \frac{3}{7} \, a c^{2} d^{3} x^{7} + \frac{1}{5} \, a d^{3} x^{5} - \frac{{\left(c^{2} x^{2} - 1\right)}^{5} b d^{3} x \arcsin\left(c x\right)}{11 \, c^{4}} - \frac{4 \, {\left(c^{2} x^{2} - 1\right)}^{4} b d^{3} x \arcsin\left(c x\right)}{33 \, c^{4}} - \frac{{\left(c^{2} x^{2} - 1\right)}^{3} b d^{3} x \arcsin\left(c x\right)}{231 \, c^{4}} - \frac{{\left(c^{2} x^{2} - 1\right)}^{5} \sqrt{-c^{2} x^{2} + 1} b d^{3}}{121 \, c^{5}} + \frac{2 \, {\left(c^{2} x^{2} - 1\right)}^{2} b d^{3} x \arcsin\left(c x\right)}{385 \, c^{4}} - \frac{4 \, {\left(c^{2} x^{2} - 1\right)}^{4} \sqrt{-c^{2} x^{2} + 1} b d^{3}}{297 \, c^{5}} - \frac{8 \, {\left(c^{2} x^{2} - 1\right)} b d^{3} x \arcsin\left(c x\right)}{1155 \, c^{4}} - \frac{{\left(c^{2} x^{2} - 1\right)}^{3} \sqrt{-c^{2} x^{2} + 1} b d^{3}}{1617 \, c^{5}} + \frac{16 \, b d^{3} x \arcsin\left(c x\right)}{1155 \, c^{4}} + \frac{2 \, {\left(c^{2} x^{2} - 1\right)}^{2} \sqrt{-c^{2} x^{2} + 1} b d^{3}}{1925 \, c^{5}} + \frac{8 \, {\left(-c^{2} x^{2} + 1\right)}^{\frac{3}{2}} b d^{3}}{3465 \, c^{5}} + \frac{16 \, \sqrt{-c^{2} x^{2} + 1} b d^{3}}{1155 \, c^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/11*a*c^6*d^3*x^11 + 1/3*a*c^4*d^3*x^9 - 3/7*a*c^2*d^3*x^7 + 1/5*a*d^3*x^
5 - 1/11*(c^2*x^2 - 1)^5*b*d^3*x*arcsin(c*x)/c^4 - 4/33*(c^2*x^2 - 1)^4*b*d
^3*x*arcsin(c*x)/c^4 - 1/231*(c^2*x^2 - 1)^3*b*d^3*x*arcsin(c*x)/c^4 - 1/12
1*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 2/385*(c^2*x^2 - 1)^2*b*d^
3*x*arcsin(c*x)/c^4 - 4/297*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 -
8/1155*(c^2*x^2 - 1)*b*d^3*x*arcsin(c*x)/c^4 - 1/1617*(c^2*x^2 - 1)^3*sqrt(
-c^2*x^2 + 1)*b*d^3/c^5 + 16/1155*b*d^3*x*arcsin(c*x)/c^4 + 2/1925*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 8/3465*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^
5 + 16/1155*sqrt(-c^2*x^2 + 1)*b*d^3/c^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.20 $\int x^3(d-c^2dx^2)^3\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=206

$$\frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3}+\frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3}+\frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3}+\frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3}-\frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3}+49b$$

```
[Out] 49/7680*b*d^3*x*(-c^2*x^2+1)^(3/2)/c^3+49/9600*b*d^3*x*(-c^2*x^2+1)^(5/2)/c
^3+7/1600*b*d^3*x*(-c^2*x^2+1)^(7/2)/c^3-1/100*b*d^3*x*(-c^2*x^2+1)^(9/2)/c
^3+49/5120*b*d^3*arcsin(c*x)/c^4-1/8*d^3*(-c^2*x^2+1)^4*(a+b*arcsin(c*x))/c
^4+1/10*d^3*(-c^2*x^2+1)^5*(a+b*arcsin(c*x))/c^4+49/5120*b*d^3*x*(-c^2*x^2+
1)^(1/2)/c^3
```

Rubi [A]
time = 0.12, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {272, 45, 4777, 12, 396, 201, 222}

$$\frac{d^3(1-c^2x^2)^5(a+b\text{ArcSin}(cx))}{10c^4}-\frac{d^3(1-c^2x^2)^4(a+b\text{ArcSin}(cx))}{8c^4}+\frac{49bd^3\text{ArcSin}(cx)}{5120c^4}-\frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3}+\frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3}+\frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3}+\frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3}+\frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (49*b*d^3*x*Sqrt[1 - c^2*x^2])/(5120*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(3/2)
)/(7680*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(5/2))/(9600*c^3) + (7*b*d^3*x*(1
- c^2*x^2)^(7/2))/(1600*c^3) - (b*d^3*x*(1 - c^2*x^2)^(9/2))/(100*c^3) + (4
9*b*d^3*ArcSin[c*x])/(5120*c^4) - (d^3*(1 - c^2*x^2)^4*(a + b*ArcSin[c*x]))
/(8*c^4) + (d^3*(1 - c^2*x^2)^5*(a + b*ArcSin[c*x]))/(10*c^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
```

```
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^3 \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)\,dx = -\frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4} + \frac{d^3(1-c^2x^2)^5\left(a+b\sin^{-1}(cx)\right)}{10c^4}$$

$$= -\frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4} + \frac{d^3(1-c^2x^2)^5\left(a+b\sin^{-1}(cx)\right)}{10c^4}$$

$$= -\frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} - \frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}(cx)\right)}{8c^4} + \frac{d^3(1-c^2x$$

$$= \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} - \frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} - \frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}\right.}{8c^4}$$

$$= \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} + \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} - \frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} -$$

$$= \frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3} + \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} + \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} -$$

$$= \frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3} + \frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3} + \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} +$$

$$= \frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3} + \frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3} + \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} +$$

Mathematica [A]
time = 0.12, size = 139, normalized size = 0.67

$$\frac{d^3\left(-1920ac^4x^4(-10+20c^2x^2-15c^4x^4+4c^6x^6)+bcx\sqrt{1-c^2x^2}\,(1185+790c^2x^2-3208c^4x^4+2736c^6x^6-768c^8x^8)-15b(79-1280c^4x^4+2560c^6x^6-1920c^8x^8+512c^{10}x^{10})\,\mathrm{ArcSin}(cx)\right)}{76800c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-1920*a*c^4*x^4*(-10 + 20*c^2*x^2 - 15*c^4*x^4 + 4*c^6*x^6) + b*c*x*S
qrt[1 - c^2*x^2]*(1185 + 790*c^2*x^2 - 3208*c^4*x^4 + 2736*c^6*x^6 - 768*c^
8*x^8) - 15*b*(79 - 1280*c^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x
^10)*ArcSin[c*x]))/(76800*c^4)
```

Maple [A]
time = 0.07, size = 202, normalized size = 0.98

method	result
derivativedivides	$-d^3a\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b\left(\frac{\arcsin(cx)c^{10}x^{10}}{10}-\frac{3\arcsin(cx)c^8x^8}{8}+\frac{\arcsin(cx)c^6x^6}{2}-\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^9x^9}{}\right.$
default	$-d^3a\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b\left(\frac{\arcsin(cx)c^{10}x^{10}}{10}-\frac{3\arcsin(cx)c^8x^8}{8}+\frac{\arcsin(cx)c^6x^6}{2}-\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^9x^9}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-d^3*a*(1/10*c^10*x^10-3/8*c^8*x^8+1/2*c^6*x^6-1/4*c^4*x^4)-d^3*b*(1
/10*arcsin(c*x)*c^10*x^10-3/8*arcsin(c*x)*c^8*x^8+1/2*arcsin(c*x)*c^6*x^6-1
/4*c^4*x^4*arcsin(c*x)+1/100*c^9*x^9*(-c^2*x^2+1)^(1/2)-57/1600*c^7*x^7*(-c
^2*x^2+1)^(1/2)+401/9600*c^5*x^5*(-c^2*x^2+1)^(1/2)-79/7680*c^3*x^3*(-c^2*x
^2+1)^(1/2)-79/5120*c*x*(-c^2*x^2+1)^(1/2)+79/5120*arcsin(c*x)))
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 439 vs. $2(178) = 356$.
time = 0.50, size = 439, normalized size = 2.13

$$-\frac{1}{10}\,ac^{6}d^{3}x^{10}+\frac{3}{8}\,ac^{4}d^{3}x^{8}-\frac{1}{2}\,ac^{2}d^{3}x^{6}-\frac{1}{12800}\left(1280\,x^{10}\arcsin\left(cx\right)+\left(\frac{128\,\sqrt{-c^{2}x^{2}+1}\,x^{9}}{c^{2}}+\frac{144\,\sqrt{-c^{2}x^{2}+1}\,x^{7}}{c^{4}}+\frac{168\,\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{6}}+\frac{210\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{8}}+\frac{315\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{10}}-\frac{315\,\arcsin\left(cx\right)}{c^{11}}\right)c\right)bc^{6}d^{3}+\frac{1}{1024}\left(384\,x^{8}\arcsin\left(cx\right)+\left(\frac{48\,\sqrt{-c^{2}x^{2}+1}\,x^{7}}{c^{2}}+\frac{56\,\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{4}}+\frac{70\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{6}}+\frac{105\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{8}}-\frac{105\,\arcsin\left(cx\right)}{c^{9}}\right)c\right)bc^{4}d^{3}+\frac{1}{4}\,ad^{3}x^{4}-\frac{1}{96}\left(48\,x^{6}\arcsin\left(cx\right)+\left(\frac{8\,\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{2}}+\frac{10\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{4}}+\frac{15\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{6}}-\frac{15\,\arcsin\left(cx\right)}{c^{7}}\right)c\right)bc^{2}d^{3}+\frac{1}{32}\left(8\,x^{4}\arcsin\left(cx\right)+\left(\frac{2\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{2}}+\frac{3\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{4}}-\frac{3\,\arcsin\left(cx\right)}{c^{5}}\right)c\right)bd^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/10*a*c^6*d^3*x^10 + 3/8*a*c^4*d^3*x^8 - 1/2*a*c^2*d^3*x^6 - 1/12800*(128
0*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 + 144*sqrt(-c^2*x^2 +
1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(-c^2*x^2 + 1)*x^3/c^
8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c*x)/c^11)*c)*b*c^6*d^3 + 1/
1024*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x
^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/
c^8 - 105*arcsin(c*x)/c^9)*c)*b*c^4*d^3 + 1/4*a*d^3*x^4 - 1/96*(48*x^6*arcs
in(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 1
5*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*c^2*d^3 + 1/32*(8*x^4
*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 -
 3*arcsin(c*x)/c^5)*c)*b*d^3
```

Fricas [**A**]
time = 2.30, size = 185, normalized size = 0.90

$$-\frac{7680\,ac^{10}d^{3}x^{10}-28800\,ac^{8}d^{3}x^{8}+38400\,ac^{6}d^{3}x^{6}-19200\,ac^{4}d^{3}x^{4}+15\,(512\,bc^{10}d^{3}x^{10}-1920\,bc^{8}d^{3}x^{8}+2560\,bc^{6}d^{3}x^{6}-1280\,bc^{4}d^{3}x^{4}+79\,bd^{3})\arcsin\left(cx\right)+(768\,bc^{9}d^{3}x^{9}-2736\,bc^{7}d^{3}x^{7}+3208\,bc^{5}d^{3}x^{5}-790\,bc^{3}d^{3}x^{3}-1185\,bcd^{3}x)\sqrt{-c^{2}x^{2}+1}}{76800\,c^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/76800*(7680*a*c^10*d^3*x^10 - 28800*a*c^8*d^3*x^8 + 38400*a*c^6*d^3*x^6
- 19200*a*c^4*d^3*x^4 + 15*(512*b*c^10*d^3*x^10 - 1920*b*c^8*d^3*x^8 + 2560
*b*c^6*d^3*x^6 - 1280*b*c^4*d^3*x^4 + 79*b*d^3)*arcsin(c*x) + (768*b*c^9*d^
3*x^9 - 2736*b*c^7*d^3*x^7 + 3208*b*c^5*d^3*x^5 - 790*b*c^3*d^3*x^3 - 1185*
b*c*d^3*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A]
time = 2.23, size = 280, normalized size = 1.36

$$\begin{cases} -\frac{ac^6d^3x^{10}}{10} + \frac{3ac^4d^3x^8}{8} - \frac{ac^2d^3x^6}{2} + \frac{ad^3x^4}{4} - \frac{bc^6d^3x^{10}\operatorname{asin}(cx)}{10} - \frac{bc^5d^3x^9\sqrt{-c^2x^2+1}}{100} + \frac{3bc^4d^3x^8\operatorname{asin}(cx)}{8} + \frac{57bc^3d^3x^7\sqrt{-c^2x^2+1}}{1600} - \frac{bc^2d^3x^6\operatorname{asin}(cx)}{2} - \frac{401bcd^3x^5\sqrt{-c^2x^2+1}}{9600} + \frac{bd^3x^4\operatorname{asin}(cx)}{4} + \frac{79bd^3x^3\sqrt{-c^2x^2+1}}{7680c} + \frac{79bd^3x\sqrt{-c^2x^2+1}}{5120c^3} - \frac{79bd^3\operatorname{asin}(cx)}{5120c^4} & \text{for } c \neq 0 \\ \frac{ad^3x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**10/10 + 3*a*c**4*d**3*x**8/8 - a*c**2*d**3*x**6/
2 + a*d**3*x**4/4 - b*c**6*d**3*x**10*asin(c*x)/10 - b*c**5*d**3*x**9*sqrt(
-c**2*x**2 + 1)/100 + 3*b*c**4*d**3*x**8*asin(c*x)/8 + 57*b*c**3*d**3*x**7*
sqrt(-c**2*x**2 + 1)/1600 - b*c**2*d**3*x**6*asin(c*x)/2 - 401*b*c*d**3*x**
5*sqrt(-c**2*x**2 + 1)/9600 + b*d**3*x**4*asin(c*x)/4 + 79*b*d**3*x**3*sqrt
(-c**2*x**2 + 1)/(7680*c) + 79*b*d**3*x*sqrt(-c**2*x**2 + 1)/(5120*c**3) -
79*b*d**3*asin(c*x)/(5120*c**4), Ne(c, 0)), (a*d**3*x**4/4, True))
```

Giac [A]
time = 0.43, size = 250, normalized size = 1.21

$$-\frac{1}{10}\,ac^6d^3x^{10} + \frac{3}{8}\,ac^4d^3x^8 - \frac{1}{2}\,ac^2d^3x^6 + \frac{1}{4}\,ad^3x^4 - \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}\,bd^3x}{100\,c^3} - \frac{(c^2x^2-1)^5bd^3\arcsin(cx)}{10\,c^4} - \frac{7\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bd^3x}{1600\,c^3} - \frac{(c^2x^2-1)^4bd^3\arcsin(cx)}{8\,c^4} + \frac{49\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^3x}{9600\,c^3} + \frac{49\,(-c^2x^2+1)^{\frac{3}{2}}bd^3x}{7680\,c^3} + \frac{49\,\sqrt{-c^2x^2+1}\,bd^3x}{5120\,c^3} + \frac{49\,bd^3\arcsin(cx)}{5120\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/10*a*c^6*d^3*x^10 + 3/8*a*c^4*d^3*x^8 - 1/2*a*c^2*d^3*x^6 + 1/4*a*d^3*x^
4 - 1/100*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 - 1/10*(c^2*x^2 -
1)^5*b*d^3*arcsin(c*x)/c^4 - 7/1600*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^
3*x/c^3 - 1/8*(c^2*x^2 - 1)^4*b*d^3*arcsin(c*x)/c^4 + 49/9600*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 49/7680*(-c^2*x^2 + 1)^(3/2)*b*d^3*x/c^
3 + 49/5120*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 49/5120*b*d^3*arcsin(c*x)/c^4
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.21 $\int x^2(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=207

$$\frac{16bd^3\sqrt{1-c^2x^2}}{315c^3}+\frac{8bd^3(1-c^2x^2)^{3/2}}{945c^3}+\frac{2bd^3(1-c^2x^2)^{5/2}}{525c^3}+\frac{bd^3(1-c^2x^2)^{7/2}}{441c^3}-\frac{bd^3(1-c^2x^2)^{9/2}}{81c^3}+\frac{1}{3}d^3x^3(a+bA$$

```
[Out] 8/945*b*d^3*(-c^2*x^2+1)^(3/2)/c^3+2/525*b*d^3*(-c^2*x^2+1)^(5/2)/c^3+1/441
*b*d^3*(-c^2*x^2+1)^(7/2)/c^3-1/81*b*d^3*(-c^2*x^2+1)^(9/2)/c^3+1/3*d^3*x^3
*(a+b*arcsin(c*x))-3/5*c^2*d^3*x^5*(a+b*arcsin(c*x))+3/7*c^4*d^3*x^7*(a+b*a
rcsin(c*x))-1/9*c^6*d^3*x^9*(a+b*arcsin(c*x))+16/315*b*d^3*(-c^2*x^2+1)^(1/
2)/c^3
```

Rubi [A]
time = 0.17, antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {276, 4777, 12, 1813, 1634}

$$-\frac{1}{9}c^6d^3x^9(a+b\text{ArcSin}(cx))+\frac{3}{7}c^4d^3x^7(a+b\text{ArcSin}(cx))-\frac{3}{5}c^2d^3x^5(a+b\text{ArcSin}(cx))+\frac{1}{3}d^3x^3(a+b\text{ArcSin}(cx))-\frac{bd^3(1-c^2x^2)^{9/2}}{81c^3}+\frac{bd^3(1-c^2x^2)^{7/2}}{441c^3}+\frac{2bd^3(1-c^2x^2)^{5/2}}{525c^3}+\frac{8bd^3(1-c^2x^2)^{3/2}}{945c^3}+\frac{16bd^3\sqrt{1-c^2x^2}}{315c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(315*c^3) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(945
*c^3) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(525*c^3) + (b*d^3*(1 - c^2*x^2)^(7/2
))/(441*c^3) - (b*d^3*(1 - c^2*x^2)^(9/2))/(81*c^3) + (d^3*x^3*(a + b*ArcSi
n[c*x]))/3 - (3*c^2*d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*c^4*d^3*x^7*(a + b*
ArcSin[c*x]))/7 - (c^6*d^3*x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}c^4d^3x^7\left(a+\right.$$

$$=\frac{16bd^3\sqrt{1-c^2x^2}}{315c^3}+\frac{8bd^3(1-c^2x^2)^{3/2}}{945c^3}+\frac{2bd^3(1-c^2x^2)^{5/2}}{525c^3}+\frac{bd^3(1}{}$$

Mathematica [A]
time = 0.10, size = 135, normalized size = 0.65

$$\frac{d^3\left(-315ac^3x^3(-105+189c^2x^2-135c^4x^4+35c^6x^6)+b\sqrt{1-c^2x^2}\,(5258+2629c^2x^2-6297c^4x^4+4675c^6x^6-1225c^8x^8)-315bc^3x^3(-105+189c^2x^2-135c^4x^4+35c^6x^6)\,\mathrm{ArcSin}(cx)\right)}{99225c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-315*a*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6) + b*Sq
rt[1 - c^2*x^2]*(5258 + 2629*c^2*x^2 - 6297*c^4*x^4 + 4675*c^6*x^6 - 1225*c
^8*x^8) - 315*b*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6)*Arc
Sin[c*x]))/(99225*c^3)
```

Maple [A]
time = 0.07, size = 194, normalized size = 0.94

method	result
derivativedivides	$\frac{-d^3a\left(\frac{1}{9}c^9x^9-\frac{3}{7}c^7x^7+\frac{3}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d^3b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{3\arcsin(cx)c^7x^7}{7}+\frac{3\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^8x^8\sqrt{}}{}\right.}{}$
default	$\frac{-d^3a\left(\frac{1}{9}c^9x^9-\frac{3}{7}c^7x^7+\frac{3}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d^3b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{3\arcsin(cx)c^7x^7}{7}+\frac{3\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^8x^8\sqrt{}}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-d^3*a*(1/9*c^9*x^9-3/7*c^7*x^7+3/5*c^5*x^5-1/3*c^3*x^3)-d^3*b*(1/9*
arcsin(c*x)*c^9*x^9-3/7*arcsin(c*x)*c^7*x^7+3/5*arcsin(c*x)*c^5*x^5-1/3*c^3
*x^3*arcsin(c*x)+1/81*c^8*x^8*(-c^2*x^2+1)^(1/2)-187/3969*c^6*x^6*(-c^2*x^2
+1)^(1/2)+2099/33075*c^4*x^4*(-c^2*x^2+1)^(1/2)-2629/99225*c^2*x^2*(-c^2*x^
2+1)^(1/2)-5258/99225*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 398 vs. $2(179) = 358$.
time = 0.48, size = 398, normalized size = 1.92

$$-\frac{1}{9}ac^6d^3x^9+\frac{3}{7}ac^4d^3x^7-\frac{1}{2835}\left(315x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right)bc^6d^3-\frac{3}{5}ac^2d^3x^5+\frac{3}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bc^4d^3-\frac{1}{25}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^2d^3+\frac{1}{3}ad^3x^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/9*a*c^6*d^3*x^9 + 3/7*a*c^4*d^3*x^7 - 1/2835*(315*x^9*arcsin(c*x) + (35*
sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x
^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^
10)*c)*b*c^6*d^3 - 3/5*a*c^2*d^3*x^5 + 3/245*(35*x^7*arcsin(c*x) + (5*sqrt(
-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)
*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^4*d^3 - 1/25*(15*x^5*arcsin(c*
x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(
-c^2*x^2 + 1)/c^6)*c)*b*c^2*d^3 + 1/3*a*d^3*x^3 + 1/9*(3*x^3*arcsin(c*x) +
c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3
```

Fricas [A]
time = 2.19, size = 177, normalized size = 0.86

$$-\frac{11025ac^9d^3x^9-42525ac^7d^3x^7+59535ac^5d^3x^5-33075ac^3d^3x^3+315\left(35bc^9d^3x^9-135bc^7d^3x^7+189bc^5d^3x^5-105bc^3d^3x^3\right)\arcsin(cx)+\left(1225bc^8d^3x^8-4675bc^6d^3x^6+6297bc^4d^3x^4-2629bc^2d^3x^2-5258bd^3\right)\sqrt{-c^2x^2+1}}{99225c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/99225*(11025*a*c^9*d^3*x^9 - 42525*a*c^7*d^3*x^7 + 59535*a*c^5*d^3*x^5 -
 33075*a*c^3*d^3*x^3 + 315*(35*b*c^9*d^3*x^9 - 135*b*c^7*d^3*x^7 + 189*b*c^
```

```
5*d^3*x^5 - 105*b*c^3*d^3*x^3)*arcsin(c*x) + (1225*b*c^8*d^3*x^8 - 4675*b*c
^6*d^3*x^6 + 6297*b*c^4*d^3*x^4 - 2629*b*c^2*d^3*x^2 - 5258*b*d^3)*sqrt(-c^
2*x^2 + 1))/c^3
```

Sympy [A]
time = 1.61, size = 265, normalized size = 1.28

$$\begin{cases} - \frac{ac^6d^3x^9}{9} + \frac{3ac^4d^3x^7}{7} - \frac{3ac^2d^3x^5}{5} + \frac{ad^3x^3}{3} - \frac{bc^6d^3x^9 \operatorname{asin}(cx)}{9} - \frac{bc^5d^3x^8\sqrt{-c^2x^2+1}}{81} + \frac{3bc^4d^3x^7 \operatorname{asin}(cx)}{7} + \frac{187bc^3d^3x^6\sqrt{-c^2x^2+1}}{3969} - \frac{3bc^2d^3x^5 \operatorname{asin}(cx)}{5} - \frac{2099bcd^3x^4\sqrt{-c^2x^2+1}}{33075} + \frac{bd^3x^3 \operatorname{asin}(cx)}{3} + \frac{2629bd^3x^2\sqrt{-c^2x^2+1}}{99225c} + \frac{5258bd^3\sqrt{-c^2x^2+1}}{99225c^3} & \text{for } c \neq 0 \\ \frac{ad^3x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**9/9 + 3*a*c**4*d**3*x**7/7 - 3*a*c**2*d**3*x**5/
5 + a*d**3*x**3/3 - b*c**6*d**3*x**9*asin(c*x)/9 - b*c**5*d**3*x**8*sqrt(-c
**2*x**2 + 1)/81 + 3*b*c**4*d**3*x**7*asin(c*x)/7 + 187*b*c**3*d**3*x**6*sq
rt(-c**2*x**2 + 1)/3969 - 3*b*c**2*d**3*x**5*asin(c*x)/5 - 2099*b*c*d**3*x*
*4*sqrt(-c**2*x**2 + 1)/33075 + b*d**3*x**3*asin(c*x)/3 + 2629*b*d**3*x**2*
sqrt(-c**2*x**2 + 1)/(99225*c) + 5258*b*d**3*sqrt(-c**2*x**2 + 1)/(99225*c*
*3), Ne(c, 0)), (a*d**3*x**3/3, True))
```

Giac [A]
time = 0.43, size = 296, normalized size = 1.43

$$-\frac{1}{9}ac^6d^3x^9 + \frac{3}{7}ac^4d^3x^7 - \frac{3}{5}ac^2d^3x^5 - \frac{(c^2x^2-1)^4bd^3x \arcsin(cx)}{9c^2} + \frac{1}{3}ad^3x^3 - \frac{(c^2x^2-1)^3bd^3x \arcsin(cx)}{63c^2} + \frac{2(c^2x^2-1)^2bd^3x \arcsin(cx)}{105c^2} - \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}\,bd^3}{81c^3} - \frac{8(c^2x^2-1)bd^3x \arcsin(cx)}{315c^2} - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bd^3}{441c^3} + \frac{16bd^3x \arcsin(cx)}{315c^2} + \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^3}{525c^3} + \frac{8(-c^2x^2+1)^{\frac{3}{2}}bd^3}{945c^3} + \frac{16\sqrt{-c^2x^2+1}\,bd^3}{315c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/9*a*c^6*d^3*x^9 + 3/7*a*c^4*d^3*x^7 - 3/5*a*c^2*d^3*x^5 - 1/9*(c^2*x^2 -
 1)^4*b*d^3*x*arcsin(c*x)/c^2 + 1/3*a*d^3*x^3 - 1/63*(c^2*x^2 - 1)^3*b*d^3*
x*arcsin(c*x)/c^2 + 2/105*(c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x)/c^2 - 1/81*(c
^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 - 8/315*(c^2*x^2 - 1)*b*d^3*x*ar
csin(c*x)/c^2 - 1/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 + 16/315
*b*d^3*x*arcsin(c*x)/c^2 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3/c
^3 + 8/945*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^3 + 16/315*sqrt(-c^2*x^2 + 1)*b*d^3
/c^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.22 $\int x(d-c^2dx^2)^3\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=150

$$\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}+\frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}+\frac{35bd^3\mathrm{ArcSin}(cx)}{1024c^2}-\frac{d^3(1$$

```
[Out] 35/1536*b*d^3*x*(-c^2*x^2+1)^(3/2)/c+7/384*b*d^3*x*(-c^2*x^2+1)^(5/2)/c+1/6
4*b*d^3*x*(-c^2*x^2+1)^(7/2)/c+35/1024*b*d^3*arcsin(c*x)/c^2-1/8*d^3*(-c^2*
x^2+1)^4*(a+b*arcsin(c*x))/c^2+35/1024*b*d^3*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.05, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}=0.130$, Rules used = {4767, 201, 222}

$$-\frac{d^3(1-c^2x^2)^4\,(a+b\mathrm{ArcSin}(cx))}{8c^2}+\frac{35bd^3\mathrm{ArcSin}(cx)}{1024c^2}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (35*b*d^3*x*Sqrt[1 - c^2*x^2])/(1024*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2))/
(1536*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2))/(384*c) + (b*d^3*x*(1 - c^2*x^2)
^(7/2))/(64*c) + (35*b*d^3*ArcSin[c*x])/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(
a + b*ArcSin[c*x]))/(8*c^2)
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{(bd^3)\int\left(1-c^2x^2\right)^{7/2}\,dx}{8c}$$
$$=\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}-\frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{(7bd^3)\int(1-}{64}$$
$$=\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}-\frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-}\right.}{8c^2}$$
$$=\frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}-\frac{d^3}{}$$
$$=\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}+\frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{b}{}$$
$$=\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}+\frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{b}{}$$

Mathematica [A]
time = 0.06, size = 110, normalized size = 0.73

$$-\frac{d^3\left(384a(-1+c^2x^2)^4+bcx\sqrt{1-c^2x^2}\left(-279+326c^2x^2-200c^4x^4+48c^6x^6\right)+3b(93-512c^2x^2+768c^4x^4-512c^6x^6+128c^8x^8)\operatorname{ArcSin}(cx)\right)}{3072c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/3072*(d^3*(384*a*(-1 + c^2*x^2)^4 + b*c*x*Sqrt[1 - c^2*x^2]*(-279 + 326*
c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6) + 3*b*(93 - 512*c^2*x^2 + 768*c^4*x^4 -
 512*c^6*x^6 + 128*c^8*x^8)*ArcSin[c*x]))/c^2
```

Maple [A]
time = 0.07, size = 160, normalized size = 1.07

method	result
derivativedivides	$\frac{-\frac{d^3\left(c^2x^2-1\right)^4a}{8}-d^3b\left(\frac{\arcsin(cx)c^8x^8}{8}-\frac{\arcsin(cx)c^6x^6}{2}+\frac{3c^4x^4\arcsin(cx)}{4}-\frac{c^2x^2\arcsin(cx)}{2}+\frac{93\arcsin(cx)}{1024}+\frac{c^7x^7\sqrt{-c^2x^2+}}{64}\right.}{c^2}$
default	$\frac{-\frac{d^3\left(c^2x^2-1\right)^4a}{8}-d^3b\left(\frac{\arcsin(cx)c^8x^8}{8}-\frac{\arcsin(cx)c^6x^6}{2}+\frac{3c^4x^4\arcsin(cx)}{4}-\frac{c^2x^2\arcsin(cx)}{2}+\frac{93\arcsin(cx)}{1024}+\frac{c^7x^7\sqrt{-c^2x^2+}}{64}\right.}{c^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/8*d^3*(c^2*x^2-1)^4*a-d^3*b*(1/8*arcsin(c*x)*c^8*x^8-1/2*arcsin(c
*x)*c^6*x^6+3/4*c^4*x^4*arcsin(c*x)-1/2*c^2*x^2*arcsin(c*x)+93/1024*arcsin(
c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(1/2)-25/384*c^5*x^5*(-c^2*x^2+1)^(1/2)+163/
1536*c^3*x^3*(-c^2*x^2+1)^(1/2)-93/1024*c*x*(-c^2*x^2+1)^(1/2)))
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 358 vs. $2(129) = 258$.
time = 0.48, size = 358, normalized size = 2.39

$$-\frac{1}{8}\,ac^{6}d^{3}x^{8}+\frac{1}{2}\,ac^{4}d^{3}x^{6}-\frac{1}{3072}\left(384\,x^{8}\arcsin\left(cx\right)+\left(\frac{48\,\sqrt{-c^{2}x^{2}+1}\,x^{7}}{c^{2}}+\frac{56\,\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{4}}+\frac{70\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{6}}+\frac{105\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{8}}-\frac{105\arcsin\left(cx\right)}{c^{9}}\right)c\right)bc^{6}d^{3}-\frac{3}{4}\,ac^{2}d^{3}x^{4}+\frac{1}{96}\left(48\,x^{6}\arcsin\left(cx\right)+\left(\frac{8\,\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{2}}+\frac{10\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{4}}+\frac{15\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{6}}-\frac{15\arcsin\left(cx\right)}{c^{7}}\right)c\right)bc^{4}d^{3}-\frac{3}{32}\left(8\,x^{4}\arcsin\left(cx\right)+\left(\frac{2\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{2}}+\frac{3\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{4}}-\frac{3\arcsin\left(cx\right)}{c^{5}}\right)c\right)bc^{2}d^{3}+\frac{1}{2}\,ad^{3}x^{2}+\frac{1}{4}\left(2\,x^{2}\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^{2}x^{2}+1}\,x}{c^{2}}-\frac{\arcsin\left(cx\right)}{c^{3}}\right)\right)bd^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/8*a*c^6*d^3*x^8 + 1/2*a*c^4*d^3*x^6 - 1/3072*(384*x^8*arcsin(c*x) + (48*
sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x
^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*
c^6*d^3 - 3/4*a*c^2*d^3*x^4 + 1/96*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 +
 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 -
 15*arcsin(c*x)/c^7)*c)*b*c^4*d^3 - 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*
x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*c^2
*d^3 + 1/2*a*d^3*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2
 - arcsin(c*x)/c^3))*b*d^3
```

Fricas [**A**]
time = 3.31, size = 173, normalized size = 1.15

$$-\frac{384\,ac^{8}d^{3}x^{8}-1536\,ac^{6}d^{3}x^{6}+2304\,ac^{4}d^{3}x^{4}-1536\,ac^{2}d^{3}x^{2}+3\,(128\,bc^{8}d^{3}x^{8}-512\,bc^{6}d^{3}x^{6}+768\,bc^{4}d^{3}x^{4}-512\,bc^{2}d^{3}x^{2}+93\,bd^{3})\arcsin\left(cx\right)+(48\,bc^{7}d^{3}x^{7}-200\,bc^{5}d^{3}x^{5}+326\,bc^{3}d^{3}x^{3}-279\,bcd^{3}x)\sqrt{-c^{2}x^{2}+1}}{3072\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3072*(384*a*c^8*d^3*x^8 - 1536*a*c^6*d^3*x^6 + 2304*a*c^4*d^3*x^4 - 1536
*a*c^2*d^3*x^2 + 3*(128*b*c^8*d^3*x^8 - 512*b*c^6*d^3*x^6 + 768*b*c^4*d^3*x
^4 - 512*b*c^2*d^3*x^2 + 93*b*d^3)*arcsin(c*x) + (48*b*c^7*d^3*x^7 - 200*b*
c^5*d^3*x^5 + 326*b*c^3*d^3*x^3 - 279*b*c*d^3*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [**A**]
time = 1.22, size = 253, normalized size = 1.69

$$\begin{cases} -\frac{ac^{6}d^{3}x^{8}}{8}+\frac{ac^{4}d^{3}x^{6}}{2}-\frac{3ac^{2}d^{3}x^{4}}{4}+\frac{ad^{3}x^{2}}{2}-\frac{bc^{6}d^{3}x^{8}\operatorname{asin}\left(cx\right)}{8}-\frac{bc^{5}d^{3}x^{7}\sqrt{-c^{2}x^{2}+1}}{64}+\frac{bc^{4}d^{3}x^{6}\operatorname{asin}\left(cx\right)}{2}+\frac{25bc^{3}d^{3}x^{5}\sqrt{-c^{2}x^{2}+1}}{384}-\frac{3bc^{2}d^{3}x^{4}\operatorname{asin}\left(cx\right)}{4}-\frac{163bcd^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{1536}+\frac{bd^{3}x^{2}\operatorname{asin}\left(cx\right)}{2}+\frac{93bd^{3}x\sqrt{-c^{2}x^{2}+1}}{1024c}-\frac{93bd^{3}\operatorname{asin}\left(cx\right)}{1024c^{2}} & \text{for}\: c \neq 0 \\ \frac{ad^{3}x^{2}}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**8/8 + a*c**4*d**3*x**6/2 - 3*a*c**2*d**3*x**4/4
+ a*d**3*x**2/2 - b*c**6*d**3*x**8*asin(c*x)/8 - b*c**5*d**3*x**7*sqrt(-c**
2*x**2 + 1)/64 + b*c**4*d**3*x**6*asin(c*x)/2 + 25*b*c**3*d**3*x**5*sqrt(-c
**2*x**2 + 1)/384 - 3*b*c**2*d**3*x**4*asin(c*x)/4 - 163*b*c*d**3*x**3*sqrt
(-c**2*x**2 + 1)/1536 + b*d**3*x**2*asin(c*x)/2 + 93*b*d**3*x*sqrt(-c**2*x*
*2 + 1)/(1024*c) - 93*b*d**3*asin(c*x)/(1024*c**2), Ne(c, 0)), (a*d**3*x**2
/2, True))
```

Giac [A]
time = 0.42, size = 202, normalized size = 1.35

$$-\frac{1}{8}\,ac^6d^3x^8+\frac{1}{2}\,ac^4d^3x^6-\frac{3}{4}\,ac^2d^3x^4-\frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bd^3x}{64\,c}-\frac{(c^2x^2-1)^4bd^3\arcsin\left(cx\right)}{8\,c^2}+\frac{7\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^3x}{384\,c}+\frac{35\,(-c^2x^2+1)^{\frac{3}{2}}bd^3x}{1536\,c}+\frac{35\,\sqrt{-c^2x^2+1}\,bd^3x}{1024\,c}+\frac{(c^2x^2-1)ad^3}{2\,c^2}+\frac{35\,bd^3\arcsin\left(cx\right)}{1024\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/8*a*c^6*d^3*x^8 + 1/2*a*c^4*d^3*x^6 - 3/4*a*c^2*d^3*x^4 - 1/64*(c^2*x^2
- 1)^3*sqrt(-c^2*x^2 + 1)*b*d^3*x/c - 1/8*(c^2*x^2 - 1)^4*b*d^3*arcsin(c*x)
/c^2 + 7/384*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3*x/c + 35/1536*(-c^2*x
^2 + 1)^(3/2)*b*d^3*x/c + 35/1024*sqrt(-c^2*x^2 + 1)*b*d^3*x/c + 1/2*(c^2*x
^2 - 1)*a*d^3/c^2 + 35/1024*b*d^3*arcsin(c*x)/c^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.23 $\int \left(d-c^2dx^2\right)^3 (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=175

$$\frac{16bd^3\sqrt{1-c^2x^2}}{35c}+\frac{8bd^3(1-c^2x^2)^{3/2}}{105c}+\frac{6bd^3(1-c^2x^2)^{5/2}}{175c}+\frac{bd^3(1-c^2x^2)^{7/2}}{49c}+d^3x(a+b\text{ArcSin}(cx))-c^2d^3x^3(a$$

```
[Out] 8/105*b*d^3*(-c^2*x^2+1)^(3/2)/c+6/175*b*d^3*(-c^2*x^2+1)^(5/2)/c+1/49*b*d^
3*(-c^2*x^2+1)^(7/2)/c+d^3*x*(a+b*arcsin(c*x))-c^2*d^3*x^3*(a+b*arcsin(c*x)
)+3/5*c^4*d^3*x^5*(a+b*arcsin(c*x))-1/7*c^6*d^3*x^7*(a+b*arcsin(c*x))+16/35
*b*d^3*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.12, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.227$, Rules used = {200, 4739, 12, 1813, 1864}

$$-\frac{1}{7}c^6d^3x^7(a+b\text{ArcSin}(cx))+\frac{3}{5}c^4d^3x^5(a+b\text{ArcSin}(cx))-c^2d^3x^3(a+b\text{ArcSin}(cx))+d^3x(a+b\text{ArcSin}(cx))+\frac{bd^3(1-c^2x^2)^{7/2}}{49c}+\frac{6bd^3(1-c^2x^2)^{5/2}}{175c}+\frac{8bd^3(1-c^2x^2)^{3/2}}{105c}+\frac{16bd^3\sqrt{1-c^2x^2}}{35c}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(35*c) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(105*c)
 + (6*b*d^3*(1 - c^2*x^2)^(5/2))/(175*c) + (b*d^3*(1 - c^2*x^2)^(7/2))/(49*
c) + d^3*x*(a + b*ArcSin[c*x]) - c^2*d^3*x^3*(a + b*ArcSin[c*x]) + (3*c^4*d
^3*x^5*(a + b*ArcSin[c*x]))/5 - (c^6*d^3*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
```

```
, 0] || EqQ[n, 1])
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int \left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx &= d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-}\right.\\ &= d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-}\right.\\ &= d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-}\right.\\ &= d^3x\left(a+b\sin^{-1}(cx)\right)-c^2d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}c^4d^3x^5\left(a+b\sin^{-}\right.\\ &= \frac{16bd^3\sqrt{1-c^2x^2}}{35c}+\frac{8bd^3\left(1-c^2x^2\right)^{3/2}}{105c}+\frac{6bd^3\left(1-c^2x^2\right)^{5/2}}{175c}+\frac{bd^3(1-}{4}\end{aligned}$$

Mathematica [A]
time = 0.10, size = 119, normalized size = 0.68

$$-\frac{d^3\left(105acx(-35+35c^2x^2-21c^4x^4+5c^6x^6)+b\sqrt{1-c^2x^2}\,(-2161+757c^2x^2-351c^4x^4+75c^6x^6)+105bcx(-35+35c^2x^2-21c^4x^4+5c^6x^6)\,\mathrm{ArcSin}(cx)\right)}{3675c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/3675*(d^3*(105*a*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + b*Sqr
t[1 - c^2*x^2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 105*b*c*x
*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]))/c
```

Maple [A]
time = 0.07, size = 164, normalized size = 0.94

method	result
derivativedivides	$\frac{-d^3a\left(\frac{1}{7}c^7x^7-\frac{3}{5}c^5x^5+c^3x^3-cx\right)-d^3b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{3\arcsin(cx)c^5x^5}{5}+c^3x^3\arcsin(cx)-cx\arcsin(cx)+\frac{c^6x^6\sqrt{-c^2x^2}}{49}\right.}{c}$

default	$\frac{-d^3a\left(\frac{1}{7}c^7x^7-\frac{3}{5}c^5x^5+c^3x^3-cx\right)-d^3b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{3\arcsin(cx)c^5x^5}{5}+c^3x^3\arcsin(cx)-cx\arcsin(cx)+\frac{c^6x^6\sqrt{-c^2x^2}}{49}\right.}{c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-d^3*a*(1/7*c^7*x^7-3/5*c^5*x^5+c^3*x^3-c*x)-d^3*b*(1/7*arcsin(c*x)*c^
7*x^7-3/5*arcsin(c*x)*c^5*x^5+c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)+1/49*c^6*
x^6*(-c^2*x^2+1)^(1/2)-117/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)+757/3675*c^2*x^2
*(-c^2*x^2+1)^(1/2)-2161/3675*(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.49, size = 307, normalized size = 1.75

$$-\frac{1}{7}ac^6d^3x^7+\frac{3}{5}ac^4d^3x^5-\frac{1}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bc^6d^3+\frac{1}{25}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^4d^3-ac^2d^3x^3-\frac{1}{3}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^2d^3+ad^3x+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bd^3}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*a*c^6*d^3*x^7 + 3/5*a*c^4*d^3*x^5 - 1/245*(35*x^7*arcsin(c*x) + (5*sqr
t(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^6*d^3 + 1/25*(15*x^5*arcsin(
c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqr
t(-c^2*x^2 + 1)/c^6)*c)*b*c^4*d^3 - a*c^2*d^3*x^3 - 1/3*(3*x^3*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d^3 + a*
d^3*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^3/c
```

Fricas [A]
time = 2.83, size = 157, normalized size = 0.90

$$-\frac{525\,ac^7d^3x^7-2205\,ac^5d^3x^5+3675\,ac^3d^3x^3-3675\,acd^3x+105\,(5\,bc^7d^3x^7-21\,bc^5d^3x^5+35\,bc^3d^3x^3-35\,bcd^3x)\arcsin(cx)+(75\,bc^6d^3x^6-351\,bc^4d^3x^4+757\,bc^2d^3x^2-2161\,bd^3)\sqrt{-c^2x^2+1}}{3675\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*(525*a*c^7*d^3*x^7 - 2205*a*c^5*d^3*x^5 + 3675*a*c^3*d^3*x^3 - 3675
*a*c*d^3*x + 105*(5*b*c^7*d^3*x^7 - 21*b*c^5*d^3*x^5 + 35*b*c^3*d^3*x^3 - 3
5*b*c*d^3*x)*arcsin(c*x) + (75*b*c^6*d^3*x^6 - 351*b*c^4*d^3*x^4 + 757*b*c^
2*d^3*x^2 - 2161*b*d^3)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A]
time = 0.77, size = 221, normalized size = 1.26

$$\begin{cases}-\frac{ac^6d^3x^7}{7}+\frac{3ac^4d^3x^5}{5}-ac^2d^3x^3+ad^3x-\frac{bc^6d^3x^7\operatorname{asin}(cx)}{7}-\frac{bc^5d^3x^6\sqrt{-c^2x^2+1}}{49}+\frac{3bc^4d^3x^5\operatorname{asin}(cx)}{5}+\frac{117bc^3d^3x^4\sqrt{-c^2x^2+1}}{1225}-bc^2d^3x^3\operatorname{asin}(cx)-\frac{757bcd^3x^2\sqrt{-c^2x^2+1}}{3675}+bd^3x\operatorname{asin}(cx)+\frac{2161bd^3\sqrt{-c^2x^2+1}}{3675c} & \text{for } c\neq 0\\ ad^3x & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**7/7 + 3*a*c**4*d**3*x**5/5 - a*c**2*d**3*x**3 +
a*d**3*x - b*c**6*d**3*x**7*asin(c*x)/7 - b*c**5*d**3*x**6*sqrt(-c**2*x**2
+ 1)/49 + 3*b*c**4*d**3*x**5*asin(c*x)/5 + 117*b*c**3*d**3*x**4*sqrt(-c**2*
x**2 + 1)/1225 - b*c**2*d**3*x**3*asin(c*x) - 757*b*c*d**3*x**2*sqrt(-c**2*
x**2 + 1)/3675 + b*d**3*x*asin(c*x) + 2161*b*d**3*sqrt(-c**2*x**2 + 1)/(367
5*c), Ne(c, 0)), (a*d**3*x, True))
```

Giac [A]
time = 0.42, size = 224, normalized size = 1.28

$$-\frac{1}{7}\,ac^6d^3x^7+\frac{3}{5}\,ac^4d^3x^5-ac^2d^3x^3-\frac{1}{7}\,{\left(c^2x^2-1\right)}^3bd^3x\arcsin\left(cx\right)+\frac{6}{35}\,{\left(c^2x^2-1\right)}^2bd^3x\arcsin\left(cx\right)-\frac{8}{35}\,{\left(c^2x^2-1\right)}bd^3x\arcsin\left(cx\right)-\frac{{\left(c^2x^2-1\right)}^3\sqrt{-c^2x^2+1}\,bd^3}{49\,c}+\frac{16}{35}\,bd^3x\arcsin\left(cx\right)+\frac{6\,{\left(c^2x^2-1\right)}^2\sqrt{-c^2x^2+1}\,bd^3}{175\,c}+ad^3x+\frac{8\,{\left(-c^2x^2+1\right)}^{\frac{3}{2}}bd^3}{105\,c}+\frac{16\,\sqrt{-c^2x^2+1}\,bd^3}{35\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/7*a*c^6*d^3*x^7 + 3/5*a*c^4*d^3*x^5 - a*c^2*d^3*x^3 - 1/7*(c^2*x^2 - 1)^
3*b*d^3*x*arcsin(c*x) + 6/35*(c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x) - 8/35*(c^
2*x^2 - 1)*b*d^3*x*arcsin(c*x) - 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*
d^3/c + 16/35*b*d^3*x*arcsin(c*x) + 6/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1
)*b*d^3/c + a*d^3*x + 8/105*(-c^2*x^2 + 1)^(3/2)*b*d^3/c + 16/35*sqrt(-c^2*
x^2 + 1)*b*d^3/c
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.24 $\int \frac{(d-c^2dx^2)^3(a+b\textbf{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=235

$$-\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}-\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}-\frac{19}{48}bd^3\text{ArcSin}(cx)+\frac{1}{2}d^3\left(1-c^2x^2\right)(a-$$

```
[Out] -7/72*b*c*d^3*x*(-c^2*x^2+1)^(3/2)-1/36*b*c*d^3*x*(-c^2*x^2+1)^(5/2)-19/48*
b*d^3*arcsin(c*x)+1/2*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))+1/4*d^3*(-c^2*x^2+
1)^2*(a+b*arcsin(c*x))+1/6*d^3*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))-1/2*I*d^3*(
a+b*arcsin(c*x))^2/b+d^3*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^
2)-1/2*I*b*d^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-19/48*b*c*d^3*x*(-c^
2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.21, antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4773, 4721, 3798, 2221, 2317, 2438, 201, 222}

$$\frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\text{ArcSin}(cx))+\frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))+\frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))-\frac{id^3(a+b\text{ArcSin}(cx))^2}{2b}+d^3\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{1}{2}ibd^3\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{19}{48}bd^3\text{ArcSin}(cx)-\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2}-\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2}-\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-19*b*c*d^3*x*Sqrt[1 - c^2*x^2])/48 - (7*b*c*d^3*x*(1 - c^2*x^2)^(3/2))/72
 - (b*c*d^3*x*(1 - c^2*x^2)^(5/2))/36 - (19*b*d^3*ArcSin[c*x])/48 + (d^3*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
]))/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/6 - ((I/2)*d^3*(a + b*Arc
Sin[c*x])^2)/b + d^3*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (
I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^3(a+b\sin^{-1}(cx))}{x}\,dx = \frac{1}{6}d^3(1-c^2x^2)^3(a+b\sin^{-1}(cx)) + d\int \frac{(d-c^2dx^2)^2(a+b\sin^{-1}(cx}{x}$$
$$= -\frac{1}{36}bcd^3x(1-c^2x^2)^{5/2} + \frac{1}{4}d^3(1-c^2x^2)^2(a+b\sin^{-1}(cx)) + \frac{1}{6}d^3(1$$
$$= -\frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{1}{36}bcd^3x(1-c^2x^2)^{5/2} + \frac{1}{2}d^3(1-c^2x^2)(a$$
$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{1}{36}bcd^3x(1-c^2x^2)$$
$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{1}{36}bcd^3x(1-c^2x^2)$$
$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{1}{36}bcd^3x(1-c^2x^2)$$
$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{1}{36}bcd^3x(1-c^2x^2)$$
$$= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{1}{36}bcd^3x(1-c^2x^2)$$

Mathematica [A]
time = 0.22, size = 207, normalized size = 0.88

$$-\frac{1}{144}d^3\left(216ac^2x^2-108ac^4x^4+24ac^6x^6+75bcx\sqrt{1-c^2x^2}-22bc^3x^3\sqrt{1-c^2x^2}+4bc^5x^5\sqrt{1-c^2x^2}+72ib\text{ArcSin}(cx)^2-150b\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)+12b\text{ArcSin}(cx)\left(18c^2x^2-9c^4x^4+2c^6x^6-12\log\left(1-e^{2i\text{ArcSin}(cx)}\right)\right)-144a\log(x)+72ib\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/144*(d^3*(216*a*c^2*x^2 - 108*a*c^4*x^4 + 24*a*c^6*x^6 + 75*b*c*x*Sqrt[1
 - c^2*x^2] - 22*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 4*b*c^5*x^5*Sqrt[1 - c^2*x^2
] + (72*I)*b*ArcSin[c*x]^2 - 150*b*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])] +
 12*b*ArcSin[c*x]*(18*c^2*x^2 - 9*c^4*x^4 + 2*c^6*x^6 - 12*Log[1 - E^((2*I)
*ArcSin[c*x])]) - 144*a*Log[x] + (72*I)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])]
))
```

Maple [A]
time = 0.25, size = 266, normalized size = 1.13

method	result
derivativedivides	$-\frac{d^3ac^6x^6}{6}+\frac{3d^3ac^4x^4}{4}-\frac{3d^3ac^2x^2}{2}+d^3a\ln(cx)-\frac{ibd^3\arcsin(cx)^2}{2}+d^3b\arcsin(cx)\ln\left(1-icx\right.$
default	$-\frac{d^3ac^6x^6}{6}+\frac{3d^3ac^4x^4}{4}-\frac{3d^3ac^2x^2}{2}+d^3a\ln(cx)-\frac{ibd^3\arcsin(cx)^2}{2}+d^3b\arcsin(cx)\ln\left(1-icx\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*d^3*a*c^6*x^6+3/4*d^3*a*c^4*x^4-3/2*d^3*a*c^2*x^2+d^3*a*ln(c*x)-1/2*I*
b*d^3*arcsin(c*x)^2+d^3*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+d^3*b*
arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*d^3*b*polylog(2,-I*c*x-(-c^2*x
^2+1)^(1/2))-I*d^3*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/192*d^3*b*arcsin
(c*x)*cos(6*arcsin(c*x))-1/1152*d^3*b*sin(6*arcsin(c*x))+1/16*d^3*b*arcsin(
c*x)*cos(4*arcsin(c*x))-1/64*d^3*b*sin(4*arcsin(c*x))+29/64*d^3*b*arcsin(c*
x)*cos(2*arcsin(c*x))-29/128*d^3*b*sin(2*arcsin(c*x))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] -1/6*a*c^6*d^3*x^6 + 3/4*a*c^4*d^3*x^4 - 3/2*a*c^2*d^3*x^2 + a*d^3*log(x) -
 integrate((b*c^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))/x, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$-d^{3}\left(\int\left(-\frac{a}{x}\right)\,dx+\int 3ac^{2}x\,dx+\int\left(-3ac^{4}x^{3}\right)\,dx+\int ac^{6}x^{5}\,dx+\int\left(-\frac{b\operatorname{asin}{\left(cx\right)}}{x}\right)\,dx+\int 3bc^{2}x\operatorname{asin}{\left(cx\right)}\,dx+\int\left(-3bc^{4}x^{3}\operatorname{asin}{\left(cx\right)}\right)\,dx+\int bc^{6}x^{5}\operatorname{asin}{\left(cx\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x,x)
```

```
[Out] -d**3*(Integral(-a/x, x) + Integral(3*a*c**2*x, x) + Integral(-3*a*c**4*x**
3, x) + Integral(a*c**6*x**5, x) + Integral(-b*asin(c*x)/x, x) + Integral(3
```

```
*b*c**2*x*asin(c*x), x) + Integral(-3*b*c**4*x**3*asin(c*x), x) + Integral(
b*c**6*x**5*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x, x)
```

3.25 $\int \frac{\left(d-c^2dx^2\right)^3(a+b\mathbf{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=164

$$-\frac{11}{5}bcd^3\sqrt{1-c^2x^2}-\frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2}-\frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2}-\frac{d^3(a+b\text{ArcSin}(cx))}{x}-3c^2d^3x(a+b\text{ArcSin}(c$$

```
[Out] -1/5*b*c*d^3*(-c^2*x^2+1)^(3/2)-1/25*b*c*d^3*(-c^2*x^2+1)^(5/2)-d^3*(a+b*ar
csin(c*x))/x-3*c^2*d^3*x*(a+b*arcsin(c*x))+c^4*d^3*x^3*(a+b*arcsin(c*x))-1/
5*c^6*d^3*x^5*(a+b*arcsin(c*x))-b*c*d^3*arctanh((-c^2*x^2+1)^(1/2))-11/5*b*
c*d^3*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {276, 4777, 12, 1813, 1634, 65, 214}

$$-\frac{1}{5}c^6d^3x^5(a+b\text{ArcSin}(cx))+c^4d^3x^3(a+b\text{ArcSin}(cx))-3c^2d^3x(a+b\text{ArcSin}(cx))-\frac{d^3(a+b\text{ArcSin}(cx))}{x}-\frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2}-\frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2}-\frac{11}{5}bcd^3\sqrt{1-c^2x^2}-bcd^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-11*b*c*d^3*Sqrt[1 - c^2*x^2])/5 - (b*c*d^3*(1 - c^2*x^2)^(3/2))/5 - (b*c*
d^3*(1 - c^2*x^2)^(5/2))/25 - (d^3*(a + b*ArcSin[c*x]))/x - 3*c^2*d^3*x*(a
+ b*ArcSin[c*x]) + c^4*d^3*x^3*(a + b*ArcSin[c*x]) - (c^6*d^3*x^5*(a + b*Ar
cSin[c*x]))/5 - b*c*d^3*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^3\,(a+b\sin^{-1}(cx))}{x^2}\,dx = -\frac{d^3(a+b\sin^{-1}(cx))}{x} - 3c^2d^3x\big(a+b\sin^{-1}(cx)\big) + c^4d^3x^3\big(a+b\sin^-$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{x} - 3c^2d^3x\big(a+b\sin^{-1}(cx)\big) + c^4d^3x^3\big(a+b\sin^-$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{x} - 3c^2d^3x\big(a+b\sin^{-1}(cx)\big) + c^4d^3x^3\big(a+b\sin^-$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{x} - 3c^2d^3x\big(a+b\sin^{-1}(cx)\big) + c^4d^3x^3\big(a+b\sin^-$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\big(1-c^2x^2\big)^{3/2} - \frac{1}{25}bcd^3\big(1-c^2x^2\big)^{5/2} -$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\big(1-c^2x^2\big)^{3/2} - \frac{1}{25}bcd^3\big(1-c^2x^2\big)^{5/2} -$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\big(1-c^2x^2\big)^{3/2} - \frac{1}{25}bcd^3\big(1-c^2x^2\big)^{5/2} -$$

Mathematica [A]
time = 0.07, size = 166, normalized size = 1.01

$$-\frac{d^3\left(25a+75ac^2x^2-25ac^4x^4+5ac^6x^6+61bcx\sqrt{1-c^2x^2}-7bc^3x^3\sqrt{1-c^2x^2}+bc^5x^5\sqrt{1-c^2x^2}+5b(5+15c^2x^2-5c^4x^4+c^6x^6)\operatorname{ArcSin}(cx)-25bcx\log(x)+25bcx\log\left(1+\sqrt{1-c^2x^2}\right)\right)}{25x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -1/25*(d^3*(25*a + 75*a*c^2*x^2 - 25*a*c^4*x^4 + 5*a*c^6*x^6 + 61*b*c*x*Sqr
t[1 - c^2*x^2] - 7*b*c^3*x^3*Sqrt[1 - c^2*x^2] + b*c^5*x^5*Sqrt[1 - c^2*x^2
] + 5*b*(5 + 15*c^2*x^2 - 5*c^4*x^4 + c^6*x^6)*ArcSin[c*x] - 25*b*c*x*Log[x
] + 25*b*c*x*Log[1 + Sqrt[1 - c^2*x^2]]))/x
```

Maple [A]
time = 0.07, size = 155, normalized size = 0.95

method	result
derivativedivides	$c\Bigg(-d^3a\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-d^3b\Bigg(\frac{\arcsin(cx)c^5x^5}{5}-c^3x^3\arcsin(cx)+3cx\arcsin(cx)$
default	$c\Bigg(-d^3a\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-d^3b\Bigg(\frac{\arcsin(cx)c^5x^5}{5}-c^3x^3\arcsin(cx)+3cx\arcsin(cx)$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-d^3*a*(1/5*c^5*x^5-c^3*x^3+3*c*x+1/c/x)-d^3*b*(1/5*arcsin(c*x)*c^5*x^5-
c^3*x^3*arcsin(c*x)+3*c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+1/25*c^4*x^4*(-c^2*
x^2+1)^(1/2)-7/25*c^2*x^2*(-c^2*x^2+1)^(1/2)+61/25*(-c^2*x^2+1)^(1/2)+arcta
nh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.48, size = 250, normalized size = 1.52

$$-\frac{1}{5}ac^6d^3x^5-\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^6d^3+ac^4d^3x^3+\frac{1}{3}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^4d^3-3ac^2d^3x-3\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bcd^3-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd^3-\frac{ad^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -1/5*a*c^6*d^3*x^5 - 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c
^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^6*d^3
+ a*c^4*d^3*x^3 + 1/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^4*d^3 - 3*a*c^2*d^3*x - 3*(c*x*arcsin(c*x) +
 sqrt(-c^2*x^2 + 1))*b*c*d^3 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x
)) + arcsin(c*x)/x)*b*d^3 - a*d^3/x
```

Fricas [A]
time = 3.13, size = 188, normalized size = 1.15

$$-\frac{10\,ac^6d^3x^6 - 50\,ac^4d^3x^4 + 150\,ac^2d^3x^2 + 25\,bcd^3x\log\left(\sqrt{-c^2x^2+1}+1\right) - 25\,bcd^3x\log\left(\sqrt{-c^2x^2+1}-1\right) + 50\,ad^3 + 10\,(bc^6d^3x^6 - 5\,bc^4d^3x^4 + 15\,bc^2d^3x^2 + 5\,bd^3)\arcsin(cx) + 2\,(bc^5d^3x^5 - 7\,bc^3d^3x^3 + 61\,bcd^3x)\sqrt{-c^2x^2+1}}{50\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/50*(10*a*c^6*d^3*x^6 - 50*a*c^4*d^3*x^4 + 150*a*c^2*d^3*x^2 + 25*b*c*d^3
*x*log(sqrt(-c^2*x^2 + 1) + 1) - 25*b*c*d^3*x*log(sqrt(-c^2*x^2 + 1) - 1) +
 50*a*d^3 + 10*(b*c^6*d^3*x^6 - 5*b*c^4*d^3*x^4 + 15*b*c^2*d^3*x^2 + 5*b*d^
3)*arcsin(c*x) + 2*(b*c^5*d^3*x^5 - 7*b*c^3*d^3*x^3 + 61*b*c*d^3*x)*sqrt(-c
^2*x^2 + 1))/x
```

Sympy [A]
time = 4.95, size = 287, normalized size = 1.75

$$-\frac{ac^6d^3x^5}{5} + ac^4d^3x^3 - 3ac^2d^3x - \frac{ad^3}{x} + \frac{bc^7d^3\left(\begin{cases}-\frac{x^4\sqrt{-c^2x^2+1}}{5c^2} - \frac{4x^2\sqrt{-c^2x^2+1}}{15c^4} - \frac{8\sqrt{-c^2x^2+1}}{15c^6} & \text{for}\ c \neq 0\\ \frac{x^6}{6} & \text{otherwise}\end{cases}\right)}{5} - \frac{bc^6d^3x^5\,\mathrm{asin}\,(cx)}{5} - bc^5d^3\left(\begin{cases}-\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c \neq 0\\ \frac{x^4}{4} & \text{otherwise}\end{cases}\right) + bc^4d^3x^3\,\mathrm{asin}\,(cx) - 3bc^2d^3\left(\begin{cases}0 & \text{for}\ c = 0\\ x\,\mathrm{asin}\,(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right) + bcd^3\left(\begin{cases}-\mathrm{acosh}\,\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|} > 1\\ i\,\mathrm{asin}\,\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right) - \frac{bd^3\,\mathrm{asin}\,(cx)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*c**6*d**3*x**5/5 + a*c**4*d**3*x**3 - 3*a*c**2*d**3*x - a*d**3/x + b*c**
7*d**3*Piecewise((-x**4*sqrt(-c**2*x**2 + 1)/(5*c**2) - 4*x**2*sqrt(-c**2*x
**2 + 1)/(15*c**4) - 8*sqrt(-c**2*x**2 + 1)/(15*c**6), Ne(c, 0)), (x**6/6,
True))/5 - b*c**6*d**3*x**5*asin(c*x)/5 - b*c**5*d**3*Piecewise((-x**2*sqrt
(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c, 0)), (x*
*4/4, True)) + b*c**4*d**3*x**3*asin(c*x) - 3*b*c**2*d**3*Piecewise((0, Eq(
c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*c*d**3*Piecewise(
(-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*d**3*
asin(c*x)/x
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 5513 vs. 2(148) = 296.
time = 28.59, size = 5513, normalized size = 33.62

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^13*d^3*x^12*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 +
5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^
7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1/2*a*
```

```
c^13*d^3*x^12/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^
2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) + b*c^12*d^3*x^11*log(abs(c
)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^
2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - b*c^12*d^3*x^11*log(sqrt(-c^2
*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sq
rt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 61/25*b*c^12*d^3*x^11/((
c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^
9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1)
+ 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^11) - 9*b*c^11*d^3*x^10*arcsin(c*x)/((c^11*x^11
/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(
-c^2*x^2 + 1) + 1)^10) - 9*a*c^11*d^3*x^10/((c^11*x^11/(sqrt(-c^2*x^2 + 1)
+ 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2
+ 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*
x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10
) + 5*b*c^10*d^3*x^9*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1
)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1
) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2
 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) -
5*b*c^10*d^3*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1
) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^
2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^
9) + 31/5*b*c^10*d^3*x^9/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^
9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c
^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 47/2*b*c^9*d^3*
x^8*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-
c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(s
qrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt
(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 47/2*a*c^9*d^3*x^8/((c^1
1*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1
)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*
(sqrt(-c^2*x^2 + 1) + 1)^8) + 10*b*c^8*d^3*x^7*log(abs(c)*abs(x))/((c^11*x^
11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*
c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
```

```
+ 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr
t(-c^2*x^2 + 1) + 1)^7) - 10*b*c^8*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^
11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9
+ 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
*(sqrt(-c^2*x^2 + 1) + 1)^7) + 22/5*b*c^8*d^3*x^7/((c^11*x^11/(sqrt(-c^2*x^
2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c
^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqr
t(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
+ 1)^7) - 182/5*b*c^7*d^3*x^6*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) +
 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6)
- 182/5*a*c^7*d^3*x^6/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(
sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*
x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x
/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 10*b*c^6*d^3*x^5*l
og(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + ...
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^2, x)
```

3.26 $\int \frac{(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=263

$$\frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2}-\frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2}-\frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x}+\frac{3}{32}bc^2d^3\text{ArcSin}(cx)-\frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b$$

```
[Out] -7/16*b*c^3*d^3*x*(-c^2*x^2+1)^(3/2)-1/2*b*c*d^3*(-c^2*x^2+1)^(5/2)/x+3/32*
b*c^2*d^3*arcsin(c*x)-3/2*c^2*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))-3/4*c^2*d^
3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))-1/2*d^3*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))
/x^2+3/2*I*c^2*d^3*(a+b*arcsin(c*x))^2/b-3*c^2*d^3*(a+b*arcsin(c*x))*ln(1-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)+3/2*I*b*c^2*d^3*polylog(2,(I*c*x+(-c^2*x^2+1)^
(1/2))^2)+3/32*b*c^3*d^3*x*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.22, antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4775, 283, 201, 222, 4773, 4721, 3798, 2221, 2317, 2438}

$$-\frac{d^3\left(1-c^2x^2\right)^3(a+b\text{ArcSin}(cx))}{2x^2}-\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))-\frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))+\frac{3ic^2d^3(a+b\text{ArcSin}(cx))^2}{2b}-3c^2d^3\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))+\frac{3}{2}ibc^2d^3\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)+\frac{3}{32}bc^2d^3\text{ArcSin}(cx)-\frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x}-\frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2}+\frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (3*b*c^3*d^3*x*Sqrt[1 - c^2*x^2])/32 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2))/
16 - (b*c*d^3*(1 - c^2*x^2)^(5/2))/(2*x) + (3*b*c^2*d^3*ArcSin[c*x])/32 - (
3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 - (3*c^2*d^3*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/4 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(2*x^2)
 + (((3*I)/2)*c^2*d^3*(a + b*ArcSin[c*x])^2)/b - 3*c^2*d^3*(a + b*ArcSin[c*
x])*Log[1 - E^((2*I)*ArcSin[c*x])] + ((3*I)/2)*b*c^2*d^3*PolyLog[2, E^((2*I
)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^3\,(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d^3(1-c^2x^2)^3\,(a+b\sin^{-1}(cx))}{2x^2} - (3c^2d)\int \frac{(d-c^2dx^2)^2\,(a+b\sin^{-1}}{x}$$

$$= -\frac{bcd^3(1-c^2x^2)^{5/2}}{2x} - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right) - \frac{d^3(1-c^2}{}$$

$$= -\frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x} - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)\left(a+\right.$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x} -$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x} +$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x} +$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x} +$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x} +$$

Mathematica [**A**]
time = 0.13, size = 226, normalized size = 0.86

$$-\frac{d^3\left(16a-48ac^4x^4+8ac^6x^6+16bcx\sqrt{1-c^2x^2}-21bc^3x^3\sqrt{1-c^2x^2}+2bc^5x^5\sqrt{1-c^2x^2}-48ibc^2x^2\mathrm{ArcSin}(cx)^2+42bc^2x^2\mathrm{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)+8b\mathrm{ArcSin}(cx)\left(2-6c^4x^4+c^6x^6+12c^2x^2\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)\right)+96ac^2x^2\log(x)-48ibc^2x^2\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)}{32x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/32*(d^3*(16*a - 48*a*c^4*x^4 + 8*a*c^6*x^6 + 16*b*c*x*Sqrt[1 - c^2*x^2]
- 21*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*c^5*x^5*Sqrt[1 - c^2*x^2] - (48*I)*b
*c^2*x^2*ArcSin[c*x]^2 + 42*b*c^2*x^2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])
] + 8*b*ArcSin[c*x]*(2 - 6*c^4*x^4 + c^6*x^6 + 12*c^2*x^2*Log[1 - E^((2*I)*
```

```
ArcSin[c*x])]) + 96*a*c^2*x^2*Log[x] - (48*I)*b*c^2*x^2*PolyLog[2, E^((2*I)
*ArcSin[c*x])]))/x^2
```

Maple [A]
time = 0.48, size = 306, normalized size = 1.16

method	result
derivativedivides	$c^2\left(-\frac{d^3 a c^4 x^4}{4}+\frac{3d^3 a c^2 x^2}{2}-\frac{d^3 a}{2c^2x^2}-3d^3 a\ln(cx)+\frac{3ib\,d^3\arcsin(cx)^2}{2}+\frac{5bc\,d^3 x\sqrt{-c^2x^2+1}}{8}+\right.$
default	$c^2\left(-\frac{d^3 a c^4 x^4}{4}+\frac{3d^3 a c^2 x^2}{2}-\frac{d^3 a}{2c^2x^2}-3d^3 a\ln(cx)+\frac{3ib\,d^3\arcsin(cx)^2}{2}+\frac{5bc\,d^3 x\sqrt{-c^2x^2+1}}{8}+\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/4*d^3*a*c^4*x^4+3/2*d^3*a*c^2*x^2-1/2*d^3*a/c^2/x^2-3*d^3*a*ln(c*x)
+3/2*I*d^3*b*arcsin(c*x)^2+5/8*b*c*d^3*x*(-c^2*x^2+1)^(1/2)+5/4*d^3*b*arcsi
n(c*x)*c^2*x^2-5/8*b*d^3*arcsin(c*x)+3*I*d^3*b*polylog(2,-I*c*x-(-c^2*x^2+1
)^(1/2))-1/2*d^3*b/c/x*(-c^2*x^2+1)^(1/2)-1/2*d^3*b*arcsin(c*x)/c^2/x^2-3*d
^3*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*d^3*b*arcsin(c*x)*ln(1-I*
c*x-(-c^2*x^2+1)^(1/2))+1/2*I*d^3*b+3*I*d^3*b*polylog(2,I*c*x+(-c^2*x^2+1)^
(1/2))-1/32*d^3*b*arcsin(c*x)*cos(4*arcsin(c*x))+1/128*d^3*b*sin(4*arcsin(c
*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*c^6*d^3*x^4 + 3/2*a*c^4*d^3*x^2 - 3*a*c^2*d^3*log(x) - 1/2*b*d^3*(sq
rt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a*d^3/x^2 - integrate((b*c^6*
d^3*x^4 - 3*b*c^4*d^3*x^2 + 3*b*c^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))/x^3, x
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d^3\left(\int\left(-\frac{a}{x^3}\right)dx+\int\frac{3ac^2}{x}\,dx+\int\left(-3ac^4x\right)dx+\int ac^6x^3\,dx+\int\left(-\frac{b\operatorname{asin}(cx)}{x^3}\right)dx+\int\frac{3bc^2\operatorname{asin}(cx)}{x}\,dx+\int\left(-3bc^4x\operatorname{asin}(cx)\right)dx+\int bc^6x^3\operatorname{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**3,x)
```

```
[Out] -d**3*(Integral(-a/x**3, x) + Integral(3*a*c**2/x, x) + Integral(-3*a*c**4*
x, x) + Integral(a*c**6*x**3, x) + Integral(-b*asin(c*x)/x**3, x) + Integra
l(3*b*c**2*asin(c*x)/x, x) + Integral(-3*b*c**4*x*asin(c*x), x) + Integral(
b*c**6*x**3*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,{\left(d-c^2\,d\,x^2\right)}^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^3, x)
```

3.27 $\int \frac{(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=178

$$\frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}+\frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}-\frac{d^3(a+b\text{ArcSin}(cx))}{3x^3}+\frac{3c^2d^3(a+b\text{ArcSin}(cx))}{x}-$$

```
[Out] 1/9*b*c^3*d^3*(-c^2*x^2+1)^(3/2)-1/3*d^3*(a+b*arcsin(c*x))/x^3+3*c^2*d^3*(a
+b*arcsin(c*x))/x+3*c^4*d^3*x*(a+b*arcsin(c*x))-1/3*c^6*d^3*x^3*(a+b*arcsin
(c*x))+17/6*b*c^3*d^3*arctanh((-c^2*x^2+1)^(1/2))+8/3*b*c^3*d^3*(-c^2*x^2+1
)^(1/2)-1/6*b*c*d^3*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.18, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {276, 4777, 12, 1813, 1635, 911, 1167, 214}

$$-\frac{1}{3}c^6d^3x^3(a+b\text{ArcSin}(cx))+3c^4d^3x(a+b\text{ArcSin}(cx))+\frac{3c^2d^3(a+b\text{ArcSin}(cx))}{x}-\frac{d^3(a+b\text{ArcSin}(cx))}{3x^3}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}+\frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}+\frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}+\frac{17}{6}bc^3d^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (8*b*c^3*d^3*Sqrt[1 - c^2*x^2])/3 - (b*c*d^3*Sqrt[1 - c^2*x^2])/(6*x^2) + (
b*c^3*d^3*(1 - c^2*x^2)^(3/2))/9 - (d^3*(a + b*ArcSin[c*x]))/(3*x^3) + (3*c
^2*d^3*(a + b*ArcSin[c*x]))/x + 3*c^4*d^3*x*(a + b*ArcSin[c*x]) - (c^6*d^3*
x^3*(a + b*ArcSin[c*x]))/3 + (17*b*c^3*d^3*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
```

```
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1635

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :
> With[{Qx = PolynomialQuotient[Px, a + b*x, x], R = PolynomialRemainder[Px
, a + b*x, x]}, Simp[R*(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((m + 1)*(b*c -
 a*d))), x] + Dist[1/((m + 1)*(b*c - a*d)), Int[(a + b*x)^(m + 1)*(c + d*x)
^n*ExpandToSum[(m + 1)*(b*c - a*d)*Qx - d*R*(m + n + 2), x], x], x]] /; Fre
eQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[m, -1] && GtQ[Expon[Px, x],
2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^3\,(a+b\sin^{-1}(cx))}{x^4}\,dx = -\frac{d^3(a+b\sin^{-1}(cx))}{3x^3}+\frac{3c^2d^3(a+b\sin^{-1}(cx))}{x}+3c^4d^3x\big(a+b\sin^{-1}$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{3x^3}+\frac{3c^2d^3(a+b\sin^{-1}(cx))}{x}+3c^4d^3x\big(a+b\sin^{-1}$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{3x^3}+\frac{3c^2d^3(a+b\sin^{-1}(cx))}{x}+3c^4d^3x\big(a+b\sin^{-1}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3(a+b\sin^{-1}(cx))}{3x^3}+\frac{3c^2d^3(a+b\sin^{-1}(cx))}{x}+$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3(a+b\sin^{-1}(cx))}{3x^3}+\frac{3c^2d^3(a+b\sin^{-1}(cx))}{x}+$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3(a+b\sin^{-1}(cx))}{3x^3}+\frac{3c^2d^3(a+b\sin^{-1}(cx))}{x}+$$

$$= \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}+\frac{1}{9}bc^3d^3\big(1-c^2x^2\big)^{3/2}-\frac{d^3(a}{}$$

$$= \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}+\frac{1}{9}bc^3d^3\big(1-c^2x^2\big)^{3/2}-\frac{d^3(a}{}$$

Mathematica [A]
time = 0.10, size = 175, normalized size = 0.98

$$-\frac{d^3\left(6a-54ac^2x^2-54ac^4x^4+6ac^6x^6+3bcx\sqrt{1-c^2x^2}-50bc^3x^3\sqrt{1-c^2x^2}+2bc^5x^5\sqrt{1-c^2x^2}+6b(1-9c^2x^2-9c^4x^4+c^6x^6)\operatorname{ArcSin}(cx)+51bc^3x^3\log(x)-51bc^3x^3\log\left(1+\sqrt{1-c^2x^2}\right)\right)}{18x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/18*(d^3*(6*a - 54*a*c^2*x^2 - 54*a*c^4*x^4 + 6*a*c^6*x^6 + 3*b*c*x*Sqrt[
1 - c^2*x^2] - 50*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*c^5*x^5*Sqrt[1 - c^2*x^
2] + 6*b*(1 - 9*c^2*x^2 - 9*c^4*x^4 + c^6*x^6)*ArcSin[c*x] + 51*b*c^3*x^3*L
og[x] - 51*b*c^3*x^3*Log[1 + Sqrt[1 - c^2*x^2]]))/x^3
```

Maple [A]
time = 0.06, size = 161, normalized size = 0.90

method	result

derivativedivides	$c^3\left(-d^3a\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)-d^3b\left(\frac{c^3x^3\arcsin(cx)}{3}-3cx\arcsin(cx)+\frac{\arcsin(cx)}{3c^3x^3}-\right.\right.$
default	$c^3\left(-d^3a\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)-d^3b\left(\frac{c^3x^3\arcsin(cx)}{3}-3cx\arcsin(cx)+\frac{\arcsin(cx)}{3c^3x^3}-\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-d^3*a*(1/3*c^3*x^3-3*c*x+1/3/c^3/x^3-3/c/x)-d^3*b*(1/3*c^3*x^3*arcsin
(c*x)-3*c*x*arcsin(c*x)+1/3/c^3/x^3*arcsin(c*x)-3/c/x*arcsin(c*x)+1/9*c^2*x
^2*(-c^2*x^2+1)^(1/2)-25/9*(-c^2*x^2+1)^(1/2)+1/6/c^2/x^2*(-c^2*x^2+1)^(1/2
)-17/6*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.48, size = 242, normalized size = 1.36

$$-\frac{1}{3}\,ac^6d^3x^3-\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^6d^3+3\,ac^4d^3x+3\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bc^3d^3+3\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bc^2d^3-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd^3+\frac{3\,ac^2d^3}{x}-\frac{ad^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*a*c^6*d^3*x^3 - 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^6*d^3 + 3*a*c^4*d^3*x + 3*(c*x*arcsin(c*x
) + sqrt(-c^2*x^2 + 1))*b*c^3*d^3 + 3*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) +
2/abs(x)) + arcsin(c*x)/x)*b*c^2*d^3 - 1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/a
bs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^3 +
3*a*c^2*d^3/x - 1/3*a*d^3/x^3
```

Fricas [A]
time = 3.13, size = 196, normalized size = 1.10

$$-\frac{12\,ac^6d^3x^6-108\,ac^4d^3x^4-51\,bc^3d^3x^3\log\left(\sqrt{-c^2x^2+1}+1\right)+51\,bc^3d^3x^3\log\left(\sqrt{-c^2x^2+1}-1\right)-108\,ac^2d^3x^2+12\,ad^3+12\left(bc^6d^3x^6-9\,bc^4d^3x^4-9\,bc^2d^3x^2+bd^3\right)\arcsin(cx)+2\left(2\,bc^5d^3x^5-50\,bc^3d^3x^3+3\,bcd^3x\right)\sqrt{-c^2x^2+1}}{36\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/36*(12*a*c^6*d^3*x^6 - 108*a*c^4*d^3*x^4 - 51*b*c^3*d^3*x^3*log(sqrt(-c^
2*x^2 + 1) + 1) + 51*b*c^3*d^3*x^3*log(sqrt(-c^2*x^2 + 1) - 1) - 108*a*c^2*
d^3*x^2 + 12*a*d^3 + 12*(b*c^6*d^3*x^6 - 9*b*c^4*d^3*x^4 - 9*b*c^2*d^3*x^2
+ b*d^3)*arcsin(c*x) + 2*(2*b*c^5*d^3*x^5 - 50*b*c^3*d^3*x^3 + 3*b*c*d^3*x)
*sqrt(-c^2*x^2 + 1))/x^3
```

Sympy [A]
time = 5.63, size = 325, normalized size = 1.83

$$- \frac{a c^{6} d^{3} x^{3}}{3} + 3 a c^{4} d^{3} x + \frac{3 a c^{2} d^{3}}{x} - \frac{a d^{3}}{3 x^{3}} + \frac{b c^{7} d^{3} \left(\begin{cases} - \frac{x^{2} \sqrt{- c^{2} x^{2} + 1}}{3 c^{2}} - \frac{2 \sqrt{- c^{2} x^{2} + 1}}{3 c^{4}} & \text{for}\: c \neq 0 \\ \frac{x^{4}}{4} & \text{otherwise} \end{cases}\right)}{3} - \frac{b c^{6} d^{3} x^{3} \operatorname{asin}{\left(c x \right)}}{3} + 3 b c^{4} d^{3} \left(\begin{cases} 0 & \text{for}\: c = 0 \\ x \operatorname{asin}{\left(c x \right)} + \frac{\sqrt{- c^{2} x^{2} + 1}}{c} & \text{otherwise} \end{cases}\right) - 3 b c^{3} d^{3} \left(\begin{cases} - \operatorname{acosh}{\left(\frac{1}{c x} \right)} & \text{for}\: \frac{1}{\left|{c^{2} x^{2}}\right|} > 1 \\ i \operatorname{asin}{\left(\frac{1}{c x} \right)} & \text{otherwise} \end{cases}\right) + \frac{3 b c^{2} d^{3} \operatorname{asin}{\left(c x \right)}}{x} + \frac{b c d^{3} \left(\begin{cases} - \frac{c^{2} \operatorname{acosh}{\left(\frac{1}{c x} \right)}}{2} + \frac{c}{2 x \sqrt{-1 + \frac{1}{c^{2} x^{2}}}} - \frac{1}{2 c x^{3} \sqrt{-1 + \frac{1}{c^{2} x^{2}}}} & \text{for}\: \frac{1}{\left|{c^{2} x^{2}}\right|} > 1 \\ \frac{i c^{2} \operatorname{asin}{\left(\frac{1}{c x} \right)}}{2} - \frac{i c \sqrt{1 - \frac{1}{c^{2} x^{2}}}}{2 x} & \text{otherwise} \end{cases}\right)}{3} - \frac{b d^{3} \operatorname{asin}{\left(c x \right)}}{3 x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*c**6*d**3*x**3/3 + 3*a*c**4*d**3*x + 3*a*c**2*d**3/x - a*d**3/(3*x**3) +
 b*c**7*d**3*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*
x**2 + 1)/(3*c**4), Ne(c, 0)), (x**4/4, True))/3 - b*c**6*d**3*x**3*asin(c*
x)/3 + 3*b*c**4*d**3*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**
2 + 1)/c, True)) - 3*b*c**3*d**3*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**
2) > 1), (I*asin(1/(c*x)), True)) + 3*b*c**2*d**3*asin(c*x)/x + b*c*d**3*Pi
ecewise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*c
*x**3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x
))/2 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), True))/3 - b*d**3*asin(c*x)/(3*x*
*3)
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^3}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^4, x)
```

3.28 $\int \frac{x^4(a+b\textbf{ArcSin}(cx))}{d-c^2dx^2} dx$

Optimal. Leaf size=172

$$-\frac{4b\sqrt{1-c^2x^2}}{3c^5d}+\frac{b(1-c^2x^2)^{3/2}}{9c^5d}-\frac{x(a+b\text{ArcSin}(cx))}{c^4d}-\frac{x^3(a+b\text{ArcSin}(cx))}{3c^2d}-\frac{2i(a+b\text{ArcSin}(cx))\text{ArcTan}(e}{c^5d}$$

```
[Out] 1/9*b*(-c^2*x^2+1)^(3/2)/c^5/d-x*(a+b*arcsin(c*x))/c^4/d-1/3*x^3*(a+b*arcsi
n(c*x))/c^2/d-2*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^5/d+
I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d-I*b*polylog(2,I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/c^5/d-4/3*b*(-c^2*x^2+1)^(1/2)/c^5/d
```

Rubi [A]
time = 0.17, antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4795, 4749, 4266, 2317, 2438, 267, 272, 45}

$$-\frac{2i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^5d}-\frac{x(a+b\text{ArcSin}(cx))}{c^4d}-\frac{x^3(a+b\text{ArcSin}(cx))}{3c^2d}+\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^5d}-\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c^5d}+\frac{b(1-c^2x^2)^{3/2}}{9c^5d}-\frac{4b\sqrt{1-c^2x^2}}{3c^5d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] (-4*b*Sqrt[1 - c^2*x^2])/(3*c^5*d) + (b*(1 - c^2*x^2)^(3/2))/(9*c^5*d) - (x
*(a + b*ArcSin[c*x]))/(c^4*d) - (x^3*(a + b*ArcSin[c*x]))/(3*c^2*d) - ((2*I
)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d) + (I*b*PolyLog[2,
(-I)*E^(I*ArcSin[c*x])])/(c^5*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c
^5*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx = -\frac{x^3(a+b\sin^{-1}(cx))}{3c^2d} + \frac{\int \frac{x^2(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx}{c^2} + \frac{b\int \frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{3cd}$$

$$= -\frac{x(a+b\sin^{-1}(cx))}{c^4d} - \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d} + \frac{\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{c^4} + \frac{b\int \frac{x}{\sqrt{1-c^2x^2}}}{c^3d}$$

$$= -\frac{b\sqrt{1-c^2x^2}}{c^5d} - \frac{x(a+b\sin^{-1}(cx))}{c^4d} - \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d} + \frac{\text{Subst}\left(\int(a+bx)\,\text{se}\right.}{}$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d} + \frac{b(1-c^2x^2)^{3/2}}{9c^5d} - \frac{x(a+b\sin^{-1}(cx))}{c^4d} - \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d} -$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d} + \frac{b(1-c^2x^2)^{3/2}}{9c^5d} - \frac{x(a+b\sin^{-1}(cx))}{c^4d} - \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d} -$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d} + \frac{b(1-c^2x^2)^{3/2}}{9c^5d} - \frac{x(a+b\sin^{-1}(cx))}{c^4d} - \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d} -$$

Mathematica [A]
time = 0.22, size = 286, normalized size = 1.66

$$-\frac{18acx+6ac^3x^3+22b\sqrt{1-c^2x^2}+2bc^2x^2\sqrt{1-c^2x^2}+9ib\pi\text{ArcSin}(cx)+18bcx\text{ArcSin}(cx)+6bc^3x^3\text{ArcSin}(cx)-9b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-18b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-9b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+18b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+9a\log(1-cx)-9a\log(1+cx)+9b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+9b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-18ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+18ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{18c^5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/18*(18*a*c*x + 6*a*c^3*x^3 + 22*b*Sqrt[1 - c^2*x^2] + 2*b*c^2*x^2*Sqrt[1
 - c^2*x^2] + (9*I)*b*Pi*ArcSin[c*x] + 18*b*c*x*ArcSin[c*x] + 6*b*c^3*x^3*A
rcSin[c*x] - 9*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 18*b*ArcSin[c*x]*Log[1 -
 I*E^(I*ArcSin[c*x])] - 9*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 18*b*ArcSin[c
*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 9*a*Log[1 - c*x] - 9*a*Log[1 + c*x] + 9*
b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 9*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x]
)/4]] - (18*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (18*I)*b*PolyLog[2, I
*E^(I*ArcSin[c*x])])/(c^5*d)
```

Maple [A]
time = 0.20, size = 249, normalized size = 1.45

method	result
derivativedivides	$-\frac{a\,c^3x^3}{3d}-\frac{acx}{d}-\frac{a\ln(cx-1)}{2d}+\frac{a\ln(cx+1)}{2d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{-c^2x^2}\right.\right.}{d}$

default	$\frac{-\frac{a\,c^3x^3}{3d}-\frac{acx}{d}-\frac{a\ln(cx-1)}{2d}+\frac{a\ln(cx+1)}{2d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-1/3*a/d*c^3*x^3-a/d*c*x-1/2*a/d*ln(c*x-1)+1/2*a/d*ln(c*x+1)-b/d*arc
sin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b/d*arcsin(c*x)*ln(1-I*(I*c*x+(
-c^2*x^2+1)^(1/2)))+I*b/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*b/d*dilog
(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-11/9*b/d*(-c^2*x^2+1)^(1/2)-b/d*arcsin(c*x
)*c*x-1/3*b/d*arcsin(c*x)*c^3*x^3-1/9*b/d*(-c^2*x^2+1)^(1/2)*c^2*x^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/6*a*(2*(c^2*x^3 + 3*x)/(c^4*d) - 3*log(c*x + 1)/(c^5*d) + 3*log(c*x - 1)
/(c^5*d)) + 1/6*(6*c^5*d*integrate(-1/6*(2*c^3*x^3 + 6*c*x - 3*log(c*x + 1)
 + 3*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d*x^2 - c^4*d), x) -
2*(c^3*x^3 + 3*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 3*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^5*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^4}{c^2x^2-1}\,dx+\int \frac{bx^4\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

[Out] -(Integral(a*x**4/(c**2*x**2 - 1), x) + Integral(b*x**4*asin(c*x)/(c**2*x**2 - 1), x))/d

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")

[Out] integrate(-(b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d), x)

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)

[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)

3.29 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{d-c^2dx^2} dx$

Optimal. Leaf size=144

$$-\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\text{ArcSin}(cx)}{4c^4d}-\frac{x^2(a+b\text{ArcSin}(cx))}{2c^2d}+\frac{i(a+b\text{ArcSin}(cx))^2}{2bc^4d}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+e^{2i\dots}\right.}{c^4d}$$

```
[Out] 1/4*b*arcsin(c*x)/c^4/d-1/2*x^2*(a+b*arcsin(c*x))/c^2/d+1/2*I*(a+b*arcsin(c
*x))^2/b/c^4/d-(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d+1
/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d-1/4*b*x*(-c^2*x^2+1)^
(1/2)/c^3/d
```

Rubi [A]

time = 0.13, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4795, 4765, 3800, 2221, 2317, 2438, 327, 222}

$$\frac{i(a+b\text{ArcSin}(cx))^2}{2bc^4d}-\frac{\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^4d}-\frac{x^2(a+b\text{ArcSin}(cx))}{2c^2d}+\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2c^4d}+\frac{b\text{ArcSin}(cx)}{4c^4d}-\frac{bx\sqrt{1-c^2x^2}}{4c^3d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/4*(b*x*Sqrt[1 - c^2*x^2])/(c^3*d) + (b*ArcSin[c*x])/(4*c^4*d) - (x^2*(a
+ b*ArcSin[c*x]))/(2*c^2*d) + ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^4*d) - ((a
 + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^4*d) + ((I/2)*b*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^3(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx &= -\frac{x^2(a+b\sin^{-1}(cx))}{2c^2d}+\frac{\int \frac{x(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx}{c^2}+\frac{b\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2cd} \\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}-\frac{x^2(a+b\sin^{-1}(cx))}{2c^2d}+\frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx,x,\sin^{-1}(c\right.}{c^4d} \\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\sin^{-1}(cx)}{4c^4d}-\frac{x^2(a+b\sin^{-1}(cx))}{2c^2d}+\frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d}-\frac{(}{} \\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\sin^{-1}(cx)}{4c^4d}-\frac{x^2(a+b\sin^{-1}(cx))}{2c^2d}+\frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d}-\frac{(}{} \\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\sin^{-1}(cx)}{4c^4d}-\frac{x^2(a+b\sin^{-1}(cx))}{2c^2d}+\frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d}-\frac{(}{} \\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\sin^{-1}(cx)}{4c^4d}-\frac{x^2(a+b\sin^{-1}(cx))}{2c^2d}+\frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d}-\frac{(}{}
\end{aligned}
$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 312 vs. 2(144) = 288.
time = 0.08, size = 312, normalized size = 2.17

$$
-\frac{2ac^2x^2+bcx\sqrt{1-c^2x^2}+4ib\pi\text{ArcSin}(cx)+2bc^2x^2\text{ArcSin}(cx)-2ib\text{ArcSin}(cx)^2-2b\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)+8b\pi\log\left(1+e^{-i\text{ArcSin}(cx)}\right)+2b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)+4b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-2b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+4b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+2a\log\left(1-c^2x^2\right)-8b\pi\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)+2b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-2b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-4ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)-4ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{4c^4d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/4*(2*a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2] + (4*I)*b*Pi*ArcSin[c*x] + 2*b*
c^2*x^2*ArcSin[c*x] - (2*I)*b*ArcSin[c*x]^2 - 2*b*ArcTan[(c*x)/(-1 + Sqrt[1
 - c^2*x^2])] + 8*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*b*Pi*Log[1 - I*E^(
I*ArcSin[c*x])] + 4*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*Pi*Log
[1 + I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] +
2*a*Log[1 - c^2*x^2] - 8*b*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*b*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] - 2*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (4*I)*b*P
olyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])]
)/(c^4*d)
```

Maple [A]
time = 0.20, size = 165, normalized size = 1.15

method	result

derivativedivides	$\frac{-\frac{a\,c^2x^2}{2d}-\frac{a\ln(cx-1)}{2d}-\frac{a\ln(cx+1)}{2d}+\frac{ib\arcsin(cx)^2}{2d}-\frac{b\sqrt{-c^2x^2+1}\,cx}{4d}-\frac{b\arcsin(cx)c^2x^2}{2d}+\frac{b\arcsin(cx)}{4d}-\frac{b\arcsin(cx)\ln\left(1+\left(\right.\right.}{}}{c^4}$
default	$\frac{-\frac{a\,c^2x^2}{2d}-\frac{a\ln(cx-1)}{2d}-\frac{a\ln(cx+1)}{2d}+\frac{ib\arcsin(cx)^2}{2d}-\frac{b\sqrt{-c^2x^2+1}\,cx}{4d}-\frac{b\arcsin(cx)c^2x^2}{2d}+\frac{b\arcsin(cx)}{4d}-\frac{b\arcsin(cx)\ln\left(1+\left(\right.\right.}{}}{c^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-1/2*a/d*c^2*x^2-1/2*a/d*ln(c*x-1)-1/2*a/d*ln(c*x+1)+1/2*I*b/d*arcsi
n(c*x)^2-1/4*b/d*(-c^2*x^2+1)^(1/2)*c*x-1/2*b/d*arcsin(c*x)*c^2*x^2+1/4*b/d
*arcsin(c*x)-b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*I*b*pol
ylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(x^2/(c^2*d) + log(c^2*x^2 - 1)/(c^4*d)) - 1/2*(2*c^4*d*integrate(1/
2*(c^2*x^2*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1)) + e^(1/2*log(c*x + 1) +
 1/2*log(-c*x + 1))*log(c*x + 1) + e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))
*log(-c*x + 1))/(c^7*d*x^4 - c^5*d*x^2 + (c^5*d*x^2 - c^3*d)*e^(log(c*x + 1
) + log(-c*x + 1))), x) + c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^4*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^3*arcsin(c*x) + a*x^3)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^3}{c^2x^2-1}\,dx+\int \frac{bx^3\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**3/(c**2*x**2 - 1), x) + Integral(b*x**3*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^3/(c^2*d*x^2 - d), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.30 $\int \frac{x^2(a+b\textbf{ArcSin}(cx))}{d-c^2dx^2} dx$

Optimal. Leaf size=124

$$-\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x(a+b\text{ArcSin}(cx))}{c^2d}-\frac{2i(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{c^3d}+\frac{ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)}{c^3d}$$

```
[Out] -x*(a+b*arcsin(c*x))/c^2/d-2*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^
(1/2))/c^3/d+I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d-I*b*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d-b*(-c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A]
time = 0.10, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4795, 4749, 4266, 2317, 2438, 267}

$$-\frac{2i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3d}-\frac{x(a+b\text{ArcSin}(cx))}{c^2d}+\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^3d}-\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c^3d}-\frac{b\sqrt{1-c^2x^2}}{c^3d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -((b*Sqrt[1 - c^2*x^2])/(c^3*d)) - (x*(a + b*ArcSin[c*x]))/(c^2*d) - ((2*I)
*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d) + (I*b*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^3*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^
3*d)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
```

```
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx &= -\frac{x(a+b\sin^{-1}(cx))}{c^2d}+\frac{\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{c^2}+\frac{b\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{cd}\\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x(a+b\sin^{-1}(cx))}{c^2d}+\frac{\operatorname{Subst}\left(\int (a+bx)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{c^3d}\\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x(a+b\sin^{-1}(cx))}{c^2d}-\frac{2i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d}-\\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x(a+b\sin^{-1}(cx))}{c^2d}-\frac{2i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d}+\\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x(a+b\sin^{-1}(cx))}{c^2d}-\frac{2i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d}+
\end{aligned}$$

Mathematica [A]

time = 0.07, size = 238, normalized size = 1.92

$$-\frac{2acx+2b\sqrt{1-c^2x^2}+ib\pi\text{ArcSin}(cx)+2bcx\text{ArcSin}(cx)-b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-2b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+2b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+a\log(1-cx)-a\log(1+cx)+b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-2ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+2ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{2c^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/2*(2*a*c*x + 2*b*Sqrt[1 - c^2*x^2] + I*b*Pi*ArcSin[c*x] + 2*b*c*x*ArcSin
[c*x] - b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*ArcSin[c*x]*Log[1 - I*E^(I*
ArcSin[c*x])] - b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 +
 I*E^(I*ArcSin[c*x])] + a*Log[1 - c*x] - a*Log[1 + c*x] + b*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] + b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*Pol
yLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c^3*d)
```

Maple [A]
time = 0.09, size = 197, normalized size = 1.59

method	result
derivativedivides	$\frac{-\frac{acx}{d}-\frac{a\ln(cx-1)}{2d}+\frac{a\ln(cx+1)}{2d}+\frac{b\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}}{c^3}$
default	$\frac{-\frac{acx}{d}-\frac{a\ln(cx-1)}{2d}+\frac{a\ln(cx+1)}{2d}+\frac{b\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}}{c^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-a/d*c*x-1/2*a/d*ln(c*x-1)+1/2*a/d*ln(c*x+1)+b/d*arcsin(c*x)*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2
)))-b/d*arcsin(c*x)*c*x-I*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*b/d*d
ilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-b/d*(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*x/(c^2*d) - log(c*x + 1)/(c^3*d) + log(c*x - 1)/(c^3*d)) + 1/2*(2
*c^3*d*integrate(-1/2*(2*c*x - log(c*x + 1) + log(-c*x + 1))*sqrt(c*x + 1)*
sqrt(-c*x + 1)/(c^4*d*x^2 - c^2*d), x) - 2*c*x*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) -
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^3*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^2*arcsin(c*x) + a*x^2)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^2}{c^2x^2-1}\,dx + \int \frac{bx^2 \operatorname{asin}{(cx)}}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**2/(c**2*x**2 - 1), x) + Integral(b*x**2*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.31 $\int \frac{x(a+b\mathbf{ArcSin}(cx))}{d-c^2dx^2}\,dx$

Optimal. Leaf size=82

$$\frac{i(a+b\text{ArcSin}(cx))^2}{2bc^2d}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+e^{2i\text{ArcSin}(cx)}\right)}{c^2d}+\frac{ib\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)}{2c^2d}$$

```
[Out] 1/2*I*(a+b*arcsin(c*x))^2/b/c^2/d-(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1
)^(1/2))^2)/c^2/d+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^2/d
```

Rubi [A]
time = 0.07, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4765, 3800, 2221, 2317, 2438}

$$\frac{i(a+b\text{ArcSin}(cx))^2}{2bc^2d}-\frac{\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^2d}+\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^2*d) - ((a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c^2*d) + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/
(c^2*d)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx = \frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(cx)\right)}{c^2d}$$
$$= \frac{i(a+b\sin^{-1}(cx))^2}{2bc^2d} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \sin^{-1}(cx)\right)}{c^2d}$$
$$= \frac{i(a+b\sin^{-1}(cx))^2}{2bc^2d} - \frac{(a+b\sin^{-1}(cx))\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{b\text{Subst}\left(\int \log\left(1 -\right.\right.}{}$$
$$= \frac{i(a+b\sin^{-1}(cx))^2}{2bc^2d} - \frac{(a+b\sin^{-1}(cx))\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} - \frac{(ib)\text{Subst}\left(\int \frac{\log(1}{x}\right.}{}$$
$$= \frac{i(a+b\sin^{-1}(cx))^2}{2bc^2d} - \frac{(a+b\sin^{-1}(cx))\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{ib\text{Li}_2\left(-e^{2i\sin^{-1}(c\right.}{2c^2d}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 244 vs. 2(82) = 164.
time = 0.04, size = 244, normalized size = 2.98

$$-\frac{2ib\pi\text{ArcSin}(cx) - ib\text{ArcSin}(cx)^2 + 4b\pi\log\left(1+e^{-i\text{ArcSin}(cx)}\right) + b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 2b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right) - b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + 2b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + a\log\left(1-c^2x^2\right) - 4b\pi\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) + b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - 2ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right) - 2ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{2c^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/2*((2*I)*b*Pi*ArcSin[c*x] - I*b*ArcSin[c*x]^2 + 4*b*Pi*Log[1 + E^((-I)*A
rcSin[c*x])] + b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 -
I*E^(I*ArcSin[c*x])] - b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*
Log[1 + I*E^(I*ArcSin[c*x])] + a*Log[1 - c^2*x^2] - 4*b*Pi*Log[Cos[ArcSin[c
*x]/2]] + b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - b*Pi*Log[Sin[(Pi + 2*Arc
Sin[c*x])/4]] - (2*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLo
g[2, I*E^(I*ArcSin[c*x])])/(c^2*d)
```

Maple [A]
time = 0.07, size = 107, normalized size = 1.30

method	result
derivativedivides	$\frac{-\frac{a\ln(cx-1)}{2d}-\frac{a\ln(cx+1)}{2d}+\frac{ib\arcsin(cx)^2}{2d}-\frac{b\arcsin(cx)\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}+\frac{ib\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+\right.\right.}{2d}}{c^2}$
default	$\frac{-\frac{a\ln(cx-1)}{2d}-\frac{a\ln(cx+1)}{2d}+\frac{ib\arcsin(cx)^2}{2d}-\frac{b\arcsin(cx)\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}+\frac{ib\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+\right.\right.}{2d}}{c^2}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)

[Out] 1/c^2*(-1/2*a/d*ln(c*x-1)-1/2*a/d*ln(c*x+1)+1/2*I*b/d*arcsin(c*x)^2-b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")

[Out] -1/2*(2*c^2*d*integrate(1/2*(e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))*log(c*x + 1) + e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))*log(-c*x + 1))/(c^5*d*x^4 - c^3*d*x^2 + (c^3*d*x^2 - c*d)*e^(log(c*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^2*d) - 1/2*a*log(c^2*d*x^2 - d)/(c^2*d)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")

[Out] integral(-(b*x*arcsin(c*x) + a*x)/(c^2*d*x^2 - d), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax}{c^2x^2-1}\,dx+\int \frac{bx\,\mathrm{asin}\,(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x/(c**2*x**2 - 1), x) + Integral(b*x*asin(c*x)/(c**2*x**2 - 1)
, x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.32 $\int \frac{a+b\text{ArcSin}(cx)}{d-c^2dx^2}\,dx$

Optimal. Leaf size=84

$$-\frac{2i(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{cd}+\frac{ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)}{cd}-\frac{ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{cd}$$

```
[Out] -2*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/d+I*b*polylog(2,-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d-I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)
))/c/d
```

Rubi [A]
time = 0.05, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4749, 4266, 2317, 2438}

$$-\frac{2i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{cd}+\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{cd}-\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2),x]
```

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + (I*b*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*d)
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx &= \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{cd} \\
&= -\frac{2i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} - \frac{b\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \sin^{-1}(cx)\right)}{cd} \\
&= -\frac{2i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\sin^{-1}(cx)}\right)}{cd} - \\
&= -\frac{2i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd} + \frac{ib\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd} - \frac{ib\text{Li}_2\left(ie^{i\sin^{-1}(cx)}\right)}{cd}
\end{aligned}
$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 207 vs. $2(84) = 168$.
time = 0.12, size = 207, normalized size = 2.46

$$
\frac{-ib\pi\text{ArcSin}(cx) + b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 2b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right) - 2b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right) - a\log(1-cx) + a\log(1+cx) - b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) + 2ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right) - 2ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{2cd}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2),x]
```

```
[Out] ((-I)*b*Pi*ArcSin[c*x] + b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x
]*Log[1 - I*E^(I*ArcSin[c*x])] + b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 2*b*Ar
cSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - a*Log[1 - c*x] + a*Log[1 + c*x] -
b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/
4]] + (2*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLog[2, I*E^(
I*ArcSin[c*x])])/(2*c*d)
```

Maple [A]
time = 0.15, size = 156, normalized size = 1.86

method	result
derivativedivides	$\frac{\frac{a\operatorname{arctanh}(cx)}{d} - \frac{ib\operatorname{arctanh}(cx)\ln\left(1-\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)}{d} + \frac{ib\operatorname{arctanh}(cx)\ln\left(1+\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)}{d} + \frac{b\operatorname{arctanh}(cx)\arcsin(cx)}{d}}{c}$

default	$\frac{\frac{a\,\mathrm{arctanh}(cx)}{d}-\frac{ib\,\mathrm{arctanh}(cx)\ln\left(1-\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)}{d}+\frac{ib\,\mathrm{arctanh}(cx)\ln\left(1+\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)}{d}+\frac{b\,\mathrm{arctanh}(cx)\arcsin(cx)}{d}-}{c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/d*arctanh(c*x)-I*b/d*arctanh(c*x)*ln(1-I*(c*x+1)/(-c^2*x^2+1)^(1/2))
+I*b/d*arctanh(c*x)*ln(1+I*(c*x+1)/(-c^2*x^2+1)^(1/2))+b/d*arctanh(c*x)*arc
sin(c*x)-I*b/d*dilog(1-I*(c*x+1)/(-c^2*x^2+1)^(1/2))+I*b/d*dilog(1+I*(c*x+1
)/(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(log(c*x + 1)/(c*d) - log(c*x - 1)/(c*d)) + 1/2*(2*c*d*integrate(1/2*
sqrt(c*x + 1)*sqrt(-c*x + 1)*(log(c*x + 1) - log(-c*x + 1))/(c^2*d*x^2 - d)
, x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^2x^2-1}\,dx+\int \frac{b\,\mathrm{asin}\,(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**2 - 1), x) + Integral(b*asin(c*x)/(c**2*x**2 - 1), x)
)/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2),x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2), x)
```

3.33 $\int \frac{a+b\text{ArcSin}(cx)}{x(d-c^2dx^2)}\,dx$

Optimal. Leaf size=71

$$-\frac{2(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)}{d}+\frac{ib\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)}{2d}-\frac{ib\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)}{2d}$$

```
[Out] -2*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+1/2*I*b*polylo
g(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^
(1/2))^2)/d
```

Rubi [A]
time = 0.08, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4769, 4504, 4268, 2317, 2438}

$$-\frac{2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}+\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (-2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])
])/d
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)}\,dx &= \frac{\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\ &= \frac{2\text{Subst}\left(\int (a+bx)\csc(2x)\,dx,x,\sin^{-1}(cx)\right)}{d}\\ &= -\frac{2(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}-\frac{b\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx,x,\sin^{-1}(cx\right.}{d}\\ &= -\frac{2(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx,x,e^{2i\sin^{-1}(cx)}\right)}{2d}\\ &= -\frac{2(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d}+\frac{ib\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{2d}-\frac{ib\text{Li}_2\left(e^{2i\sin^{-1}(cx}\right.}{2d}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 105, normalized size = 1.48

$$\frac{2b\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-2b\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)+2a\log(x)-a\log\left(1-c^2x^2\right)+ib\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)-ib\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (2*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - 2*b*ArcSin[c*x]*Log[1 + E
^((2*I)*ArcSin[c*x])] + 2*a*Log[x] - a*Log[1 - c^2*x^2] + I*b*PolyLog[2, -E
^((2*I)*ArcSin[c*x])] - I*b*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Maple [A]
time = 0.12, size = 164, normalized size = 2.31

method	result

derivativedivides	$-\frac{a\ln(cx+1)}{2d}-\frac{a\ln(cx-1)}{2d}+\frac{a\ln(cx)}{d}+\frac{b\arcsin(cx)\ln\left(1-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}-\frac{b\arcsin(cx)\ln\left(1+\left(i\right.\right.}{}$
default	$-\frac{a\ln(cx+1)}{2d}-\frac{a\ln(cx-1)}{2d}+\frac{a\ln(cx)}{d}+\frac{b\arcsin(cx)\ln\left(1-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}-\frac{b\arcsin(cx)\ln\left(1+\left(i\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d*ln(c*x+1)-1/2*a/d*ln(c*x-1)+a/d*ln(c*x)+b/d*arcsin(c*x)*ln(1-(I*c*
x+(-c^2*x^2+1)^(1/2))^2)-b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
+1/2*I*b/d*dilog(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*b/d*dilog(1-(I*c*x+(
-c^2*x^2+1)^(1/2))^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(c*x + 1)/d + log(c*x - 1)/d - 2*log(x)/d) - b*integrate(arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^3 - d*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^3 - d*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int\frac{a}{c^2x^3-x}\,dx+\int\frac{b\,\mathrm{asin}\,(cx)}{c^2x^3-x}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**3 - x), x) + Integral(b*asin(c*x)/(c**2*x**3 - x), x)
)/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,\left(d-c^2\,d\,x^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)), x)
```

3.34 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x^2(d-c^2dx^2)}\,dx$

Optimal. Leaf size=116

$$-\frac{a+b\text{ArcSin}(cx)}{dx}-\frac{2ic(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{d}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{ibc\text{PolyLog}(2,-ie}{d}$$

```
[Out] (-a-b*arcsin(c*x))/d/x-2*I*c*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1
/2))/d-b*c*arctanh((-c^2*x^2+1)^(1/2))/d+I*b*c*polylog(2,-I*(I*c*x+(-c^2*x^
2+1)^(1/2)))/d-I*b*c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d
```

Rubi [A]
time = 0.11, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4789, 4749, 4266, 2317, 2438, 272, 65, 214}

$$-\frac{2ic\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{a+b\text{ArcSin}(cx)}{dx}+\frac{ibc\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{d}-\frac{ibc\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{d}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*Arc
Sin[c*x])])/d - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (I*b*c*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/d - (I*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2(d-c^2dx^2)}\,dx = -\frac{a+b\sin^{-1}(cx)}{dx} + c^2\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx + \frac{(bc)\int \frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx} + \frac{c\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{d} + \frac{(bc)\text{Subst}\left(\int \frac{1}{x\sqrt{1-}\right.}{2d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx} - \frac{2ic(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d} - \frac{b\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x,\right.}{cd}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx} - \frac{2ic(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d} - \frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right.}{d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx} - \frac{2ic(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d} - \frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right.}{d}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 259 vs. $2(116) = 232$.
time = 0.24, size = 259, normalized size = 2.23

$$-\frac{2a+2b\text{ArcSin}(cx)+ibc\pi x\text{ArcSin}(cx)+2bcx\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-bc\pi x\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-2bcx\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-bc\pi x\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+2bcx\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+acx\log(1-cx)-acx\log(1+cx)+bc\pi x\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+bc\pi x\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-2ibcx\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+2ibcx\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{2dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*(2*a + 2*b*ArcSin[c*x] + I*b*c*Pi*x*ArcSin[c*x] + 2*b*c*x*ArcTanh[Sqrt
[1 - c^2*x^2]] - b*c*Pi*x*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*c*x*ArcSin[c*x
]*Log[1 - I*E^(I*ArcSin[c*x])] - b*c*Pi*x*Log[1 + I*E^(I*ArcSin[c*x])] + 2*
b*c*x*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + a*c*x*Log[1 - c*x] - a*c*x
*Log[1 + c*x] + b*c*Pi*x*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + b*c*Pi*x*Log[S
in[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*c*x*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
] + (2*I)*b*c*x*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*x)
```

Maple [A]
time = 0.18, size = 236, normalized size = 2.03

method	result
derivativedivides	$c\left(-\frac{a}{dcx}+\frac{a\ln(cx+1)}{2d}-\frac{a\ln(cx-1)}{2d}-\frac{b\arcsin(cx)}{dcx}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\arcsi}{}\right.$

default	$c\left(-\frac{a}{dcx}+\frac{a\ln(cx+1)}{2d}-\frac{a\ln(cx-1)}{2d}-\frac{b\arcsin(cx)}{dcx}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\operatorname{arc}}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c*(-a/d/c/x+1/2*a/d*ln(c*x+1)-1/2*a/d*ln(c*x-1)-b/d*arcsin(c*x)/c/x-b/d*arc
sin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b/d*arcsin(c*x)*ln(1-I*(I*c*x+(
-c^2*x^2+1)^(1/2)))+b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-b/d*ln(1+I*c*x+(-c^2
*x^2+1)^(1/2))+I*b/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*b/d*dilog(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(c*log(c*x + 1)/d - c*log(c*x - 1)/d - 2/(d*x)) + 1/2*(c*x*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - c*x*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*d*x*integrate(1/2*(c^2*x*log(c*x + 1)
 - c^2*x*log(-c*x + 1) - 2*c)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^3 - d*x
), x) - 2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(d*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^4 - d*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^2x^4-x^2}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^2x^4-x^2}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**4 - x**2), x) + Integral(b*asin(c*x)/(c**2*x**4 - x**
2), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,\left(d-c^2\,d\,x^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)), x)
```

3.35 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d-c^2dx^2)}\,dx$

Optimal. Leaf size=124

$$-\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\text{ArcSin}(cx)}{2dx^2}-\frac{2c^2(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)}{d}+\frac{ibc^2\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(c}\right.}{2d}$$

[Out] 1/2*(-a-b*arcsin(c*x))/d/x^2-2*c^2*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+1/2*I*b*c^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*I*b*c^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*b*c*(-c^2*x^2+1)^(1/2)/d/x

Rubi [A]
time = 0.13, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4789, 4769, 4504, 4268, 2317, 2438, 270}

$$-\frac{2c^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{a+b\text{ArcSin}(cx)}{2dx^2}+\frac{ibc^2\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d}-\frac{ibc^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d}-\frac{bc\sqrt{1-c^2x^2}}{2dx}$$

Antiderivative was successfully verified.

[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)),x]

[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) - (2*c^2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*c^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3(d-c^2dx^2)}\,dx = -\frac{a+b\sin^{-1}(cx)}{2dx^2} + c^2\int \frac{a+b\sin^{-1}(cx)}{x(d-c^2dx^2)}\,dx + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{c^2\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx, x, \sin^{-1}(c\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{(2c^2)\,\text{Subst}\left(\int (a+bx)\csc(2x)\,dx, x, \sin^{-1}(cx)\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} - \frac{2c^2(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d} - \frac{(b}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} - \frac{2c^2(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d} + \frac{(i}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} - \frac{2c^2(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d} + \frac{ib}{}$$

Mathematica [A]

time = 0.23, size = 149, normalized size = 1.20

$$-\frac{\frac{a}{x^2} - 2ac^2\log(x) + ac^2\log(1-c^2x^2) + bc^2\left(\frac{\sqrt{1-c^2x^2}}{cx} + \frac{\text{ArcSin}(cx)}{c^2x^2} - 2\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right) + 2\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right) - i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right) + i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*(a/x^2 - 2*a*c^2*Log[x] + a*c^2*Log[1 - c^2*x^2] + b*c^2*(Sqrt[1 - c^2
*x^2]/(c*x) + ArcSin[c*x]/(c^2*x^2) - 2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin
[c*x])] + 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - I*PolyLog[2, -E^((
2*I)*ArcSin[c*x])] + I*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/d
```

Maple [A]

time = 0.24, size = 278, normalized size = 2.24

method	result
derivativedivides	$c^2\left(-\frac{a\ln(cx+1)}{2d} - \frac{a\ln(cx-1)}{2d} - \frac{a}{2d\,c^2x^2} + \frac{a\ln(cx)}{d} + \frac{ib}{2d} - \frac{b\sqrt{-c^2x^2+1}}{2dcx} - \frac{b\arcsin(cx)}{2d\,c^2x^2} + \frac{b\arcsin(\right.$
default	$c^2\left(-\frac{a\ln(cx+1)}{2d} - \frac{a\ln(cx-1)}{2d} - \frac{a}{2d\,c^2x^2} + \frac{a\ln(cx)}{d} + \frac{ib}{2d} - \frac{b\sqrt{-c^2x^2+1}}{2dcx} - \frac{b\arcsin(cx)}{2d\,c^2x^2} + \frac{b\arcsin(\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/2*a/d*ln(c*x+1)-1/2*a/d*ln(c*x-1)-1/2*a/d/c^2/x^2+a/d*ln(c*x)+1/2*I
*b/d-1/2*b/d/c/x*(-c^2*x^2+1)^(1/2)-1/2*b/d*arcsin(c*x)/c^2/x^2+b/d*arcsin(
c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b/d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/
2))-b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*I*b*polylog(2,-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+b/d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))-I*b/d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*(c^2*log(c*x + 1)/d + c^2*log(c*x - 1)/d - 2*c^2*log(x)/d + 1/(d*x^2))
*a - b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^5 - d*
x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^2x^5-x^3}\,dx+\int \frac{b\operatorname{asin}{(cx)}}{c^2x^5-x^3}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a/(c**2*x**5 - x**3), x) + Integral(b*asin(c*x)/(c**2*x**5 - x**
3), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,\left(d-c^2\,d\,x^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)), x)
```

3.36 $\int \frac{a+b\text{ArcSin}(cx)}{x^4(d-c^2dx^2)}\,dx$

Optimal. Leaf size=173

$$-\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{a+b\text{ArcSin}(cx)}{3dx^3}-\frac{c^2(a+b\text{ArcSin}(cx))}{dx}-\frac{2ic^3(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{d}-\frac{7bc^3\text{ t}}{}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3-c^2*(a+b*arcsin(c*x))/d/x-2*I*c^3*(a+b*arcsin(
c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d-7/6*b*c^3*arctanh((-c^2*x^2+1)^(1/
2))/d+I*b*c^3*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-I*b*c^3*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-1/6*b*c*(-c^2*x^2+1)^(1/2)/d/x^2
```

Rubi [A]
time = 0.17, antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4789, 4749, 4266, 2317, 2438, 272, 65, 214, 44}

$$-\frac{2ic^3\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{c^2(a+b\text{ArcSin}(cx))}{dx}-\frac{a+b\text{ArcSin}(cx)}{3dx^3}+\frac{ibc^3\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{d}-\frac{ibc^3\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{d}-\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{7bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[1 - c^2*x^2])/(d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) - (c^2
*(a + b*ArcSin[c*x]))/(d*x) - ((2*I)*c^3*(a + b*ArcSin[c*x])*ArcTan[E^(I*Ar
cSin[c*x])])/d - (7*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (I*b*c^3*Poly
Log[2, (-I)*E^(I*ArcSin[c*x])])/d - (I*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])
])/d
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)}\,dx = -\frac{a+b\sin^{-1}(cx)}{3dx^3} + c^2\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)}\,dx + \frac{(bc)\int \frac{1}{x^3\sqrt{1-c^2x^2}}\,dx}{3d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2(a+b\sin^{-1}(cx))}{dx} + c^4\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx + \frac{(bc)\text{Subst}\left(\int \frac{}{x^2}\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2(a+b\sin^{-1}(cx))}{dx} + \frac{c^3\text{Subst}\left(\int (a+bx)\sec(x)\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2(a+b\sin^{-1}(cx))}{dx} - \frac{2ic^3(a+b\sin^{-1}(cx))\tan^{}}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2(a+b\sin^{-1}(cx))}{dx} - \frac{2ic^3(a+b\sin^{-1}(cx))\tan^{}}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} - \frac{c^2(a+b\sin^{-1}(cx))}{dx} - \frac{2ic^3(a+b\sin^{-1}(cx))\tan^{}}{d}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 350 vs. $2(173) = 346$.
time = 0.09, size = 350, normalized size = 2.02

$$-\frac{2a+6ac^2x^2+bcx\sqrt{1-c^2x^2}+2b\text{ArcSin}(cx)+6bc^2x^2\text{ArcSin}(cx)+3ibc^3\pi x^3\text{ArcSin}(cx)+7bc^3x^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-3bc^3\pi x^3\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-6bc^3x^3\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-3bc^3\pi x^3\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+6bc^3x^3\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+3ac^3x^3\log(1-cx)-3ac^3x^3\log(1+cx)+3bc^3\pi x^3\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+3bc^3\pi x^3\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-6ibc^3x^3\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+6ibc^3x^3\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{6dx^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -1/6*(2*a + 6*a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2] + 2*b*ArcSin[c*x] + 6*b*c
^2*x^2*ArcSin[c*x] + (3*I)*b*c^3*Pi*x^3*ArcSin[c*x] + 7*b*c^3*x^3*ArcTanh[S
qrt[1 - c^2*x^2]] - 3*b*c^3*Pi*x^3*Log[1 - I*E^(I*ArcSin[c*x])] - 6*b*c^3*x
^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*b*c^3*Pi*x^3*Log[1 + I*E^(I
*ArcSin[c*x])] + 6*b*c^3*x^3*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a
*c^3*x^3*Log[1 - c*x] - 3*a*c^3*x^3*Log[1 + c*x] + 3*b*c^3*Pi*x^3*Log[-Cos[
(Pi + 2*ArcSin[c*x])/4]] + 3*b*c^3*Pi*x^3*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
- (6*I)*b*c^3*x^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*c^3*x^3*Poly
Log[2, I*E^(I*ArcSin[c*x])])/(d*x^3)
```

Maple [**A**]
time = 0.21, size = 291, normalized size = 1.68

method	result

derivativedivides	$c^3\left(\frac{a\ln(cx+1)}{2d}-\frac{a\ln(cx-1)}{2d}-\frac{a}{3d\,c^3x^3}-\frac{a}{dcx}-\frac{b\arcsin(cx)}{dcx}-\frac{b\sqrt{-c^2x^2+1}}{6d\,c^2x^2}-\frac{b\arcsin(cx)}{3d\,c^3x^3}+\frac{7b\ln\left(\right.}{}\right.$
default	$c^3\left(\frac{a\ln(cx+1)}{2d}-\frac{a\ln(cx-1)}{2d}-\frac{a}{3d\,c^3x^3}-\frac{a}{dcx}-\frac{b\arcsin(cx)}{dcx}-\frac{b\sqrt{-c^2x^2+1}}{6d\,c^2x^2}-\frac{b\arcsin(cx)}{3d\,c^3x^3}+\frac{7b\ln\left(\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(1/2*a/d*ln(c*x+1)-1/2*a/d*ln(c*x-1)-1/3*a/d/c^3/x^3-a/d/c/x-b/d*arcsin
(c*x)/c/x-1/6*b/d/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/3*b/d*arcsin(c*x)/c^3/x^3+7/
6*b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-7/6*b/d*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
-I*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b/d*arcsin(c*x)*ln(1-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*b
/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/6*(3*c^3*log(c*x + 1)/d - 3*c^3*log(c*x - 1)/d - 2*(3*c^2*x^2 + 1)/(d*x^3
))*a + 1/6*(3*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
1) - 3*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 6
*d*x^3*integrate(1/6*(3*c^4*x^3*log(c*x + 1) - 3*c^4*x^3*log(-c*x + 1) - 6*
c^3*x^2 - 2*c)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^5 - d*x^3), x) - 2*(3*
c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(d*x^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^6 - d*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^2x^6-x^4}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^2x^6-x^4}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d),x)

[Out] -(Integral(a/(c**2*x**6 - x**4), x) + Integral(b*asin(c*x)/(c**2*x**6 - x**4), x))/d

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="giac")

[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^4), x)

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^4\,\left(d-c^2\,d\,x^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)),x)

[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)), x)

3.37 $\int \frac{x^4(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=187

$$-\frac{b}{2c^5d^2\sqrt{1-c^2x^2}}+\frac{b\sqrt{1-c^2x^2}}{c^5d^2}+\frac{3x(a+b\text{ArcSin}(cx))}{2c^4d^2}+\frac{x^3(a+b\text{ArcSin}(cx))}{2c^2d^2(1-c^2x^2)}+\frac{3i(a+b\text{ArcSin}(cx))\text{ArcTa}}{c^5d^2}$$

```
[Out] 3/2*x*(a+b*arcsin(c*x))/c^4/d^2+1/2*x^3*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2
+1)+3*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^5/d^2-3/2*I*b*
polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2+3/2*I*b*polylog(2,I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/c^5/d^2-1/2*b/c^5/d^2/(-c^2*x^2+1)^(1/2)+b*(-c^2*x^2+
1)^(1/2)/c^5/d^2
```

Rubi [A]
time = 0.17, antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4791, 4795, 4749, 4266, 2317, 2438, 267, 272, 45}

$$\frac{3i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^5d^2}+\frac{3x(a+b\text{ArcSin}(cx))}{2c^4d^2}+\frac{x^3(a+b\text{ArcSin}(cx))}{2c^2d^2(1-c^2x^2)}-\frac{3ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{2c^5d^2}+\frac{3ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{2c^5d^2}+\frac{b\sqrt{1-c^2x^2}}{c^5d^2}-\frac{b}{2c^5d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*b/(c^5*d^2*Sqrt[1 - c^2*x^2]) + (b*Sqrt[1 - c^2*x^2])/(c^5*d^2) + (3*x
*(a + b*ArcSin[c*x]))/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1
 - c^2*x^2)) + ((3*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d
^2) - (((3*I)/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^2) + (((3*I)/
2)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
```

```
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x^4(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^2}\,dx &= \frac{x^3(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^3}{(1-c^2x^2)^{3/2}}\,dx}{2cd^2} - \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx}{2c^2d} \\ &= \frac{3x(a+b\sin^{-1}(cx))}{2c^4d^2} + \frac{x^3(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{(3b)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{2c^3d^2} - \frac{b\mathrm{Subst}\big(\int \\ &= \frac{3b\sqrt{1-c^2x^2}}{2c^5d^2} + \frac{3x(a+b\sin^{-1}(cx))}{2c^4d^2} + \frac{x^3(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{3\mathrm{Subst}\big(\int(a+bx \\ &= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x(a+b\sin^{-1}(cx))}{2c^4d^2} + \frac{x^3(a+b\sin^{-1}(cx)}{2c^2d^2(1-c^2x^2)} \\ &= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x(a+b\sin^{-1}(cx))}{2c^4d^2} + \frac{x^3(a+b\sin^{-1}(cx)}{2c^2d^2(1-c^2x^2)} \\ &= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x(a+b\sin^{-1}(cx))}{2c^4d^2} + \frac{x^3(a+b\sin^{-1}(cx)}{2c^2d^2(1-c^2x^2)}\end{aligned}$$

Mathematica [A]
time = 0.28, size = 332, normalized size = 1.78

$$\frac{4acx+4b\sqrt{1-c^2x^2}+\frac{b\sqrt{1-c^2x^2}}{-1+cx}-\frac{b\sqrt{1-c^2x^2}}{1+cx}-\frac{2acx}{-1+c^2x^2}+3ib\pi\mathrm{ArcSin}(cx)+4bcx\mathrm{ArcSin}(cx)+\frac{b\mathrm{ArcSin}(cx)}{1-cx}-\frac{b\mathrm{ArcSin}(cx)}{1+cx}-3b\pi\log\left(1-ie^{i\mathrm{ArcSin}(cx)}\right)-6b\mathrm{ArcSin}(cx)\log\left(1-ie^{i\mathrm{ArcSin}(cx)}\right)-3b\pi\log\left(1+ie^{i\mathrm{ArcSin}(cx)}\right)+6b\mathrm{ArcSin}(cx)\log\left(1+ie^{i\mathrm{ArcSin}(cx)}\right)+3a\log(1-cx)-3a\log(1+cx)+3b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\mathrm{ArcSin}(cx))\right)\right)+3b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\mathrm{ArcSin}(cx))\right)\right)-6ib\mathrm{PolyLog}\left(2,-ie^{i\mathrm{ArcSin}(cx)}\right)+6ib\mathrm{PolyLog}\left(2,ie^{i\mathrm{ArcSin}(cx)}\right)}{4c^5d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (4*a*c*x + 4*b*Sqrt[1 - c^2*x^2] + (b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (b*Sq
rt[1 - c^2*x^2])/(1 + c*x) - (2*a*c*x)/(-1 + c^2*x^2) + (3*I)*b*Pi*ArcSin[c
*x] + 4*b*c*x*ArcSin[c*x] + (b*ArcSin[c*x])/(1 - c*x) - (b*ArcSin[c*x])/(1
+ c*x) - 3*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 6*b*ArcSin[c*x]*Log[1 - I*E^
(I*ArcSin[c*x])] - 3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b*ArcSin[c*x]*Lo
g[1 + I*E^(I*ArcSin[c*x])] + 3*a*Log[1 - c*x] - 3*a*Log[1 + c*x] + 3*b*Pi*L
og[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
- (6*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(4*c^5*d^2)
```

Maple [A]
time = 0.34, size = 273, normalized size = 1.46

method	result
derivativedivides	$\frac{\frac{acx}{d^2}-\frac{a}{4d^2(cx+1)}-\frac{3a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}+\frac{3a\ln(cx-1)}{4d^2}+\frac{b\sqrt{-c^2x^2+1}}{d^2}+\frac{b\arcsin(cx)cx}{d^2}-\frac{b\arcsin(cx)cx}{2d^2\left(c^2x^2-1\right)}+\frac{b\sqrt{-c^2x^2}}{2d^2\left(c^2x^2-\right.}}{}$
default	$\frac{\frac{acx}{d^2}-\frac{a}{4d^2(cx+1)}-\frac{3a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}+\frac{3a\ln(cx-1)}{4d^2}+\frac{b\sqrt{-c^2x^2+1}}{d^2}+\frac{b\arcsin(cx)cx}{d^2}-\frac{b\arcsin(cx)cx}{2d^2\left(c^2x^2-1\right)}+\frac{b\sqrt{-c^2x^2}}{2d^2\left(c^2x^2-\right.}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(a/d^2*c*x-1/4*a/d^2/(c*x+1)-3/4*a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)+3/
4*a/d^2*ln(c*x-1)+b/d^2*(-c^2*x^2+1)^(1/2)+b/d^2*arcsin(c*x)*c*x-1/2*b/d^2/
(c^2*x^2-1)*arcsin(c*x)*c*x+1/2*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+3/2*b/
d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*b/d^2*arcsin(c*x)*ln
(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*I*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^
(1/2)))+3/2*I*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^6*d^2*x^2 - c^4*d^2) - 4*x/(c^4*d^2) + 3*log(c*x + 1)/(c^5*d
^2) - 3*log(c*x - 1)/(c^5*d^2)) - 1/4*(3*(c^2*x^2 - 1)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^2*x^2 - 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(2*c^3*x^3 - 3*c*x)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) + 4*(c^7*d^2*x^2 - c^5*d^2)*integrate(-1/4*(4*c
^3*x^3 - 6*c*x - 3*(c^2*x^2 - 1)*log(c*x + 1) + 3*(c^2*x^2 - 1)*log(-c*x +
1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^8*d^2*x^4 - 2*c^6*d^2*x^2 + c^4*d^2), x
))*b/(c^7*d^2*x^2 - c^5*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{ax^4}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^4\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**4/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**4*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.38 $\int \frac{x^3(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=155

$$-\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}}+\frac{b\text{ArcSin}(cx)}{2c^4d^2}+\frac{x^2(a+b\text{ArcSin}(cx))}{2c^2d^2(1-c^2x^2)}-\frac{i(a+b\text{ArcSin}(cx))^2}{2bc^4d^2}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+e\right.}{c^4d^2}$$

```
[Out] 1/2*b*arcsin(c*x)/c^4/d^2+1/2*x^2*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)-1/
2*I*(a+b*arcsin(c*x))^2/b/c^4/d^2+(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1
)^(1/2))^2)/c^4/d^2-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d^
2-1/2*b*x/c^3/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4791, 4765, 3800, 2221, 2317, 2438, 294, 222}

$$-\frac{i(a+b\text{ArcSin}(cx))^2}{2bc^4d^2}+\frac{\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^4d^2}+\frac{x^2(a+b\text{ArcSin}(cx))}{2c^2d^2(1-c^2x^2)}-\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2c^4d^2}+\frac{b\text{ArcSin}(cx)}{2c^4d^2}-\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*(b*x)/(c^3*d^2*Sqrt[1 - c^2*x^2]) + (b*ArcSin[c*x])/(2*c^4*d^2) + (x^2
*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 - c^2*x^2)) - ((I/2)*(a + b*ArcSin[c*x]
)^2)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^
4*d^2) - ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^2}\,dx = \frac{x^2(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{2cd^2} - \frac{\int \frac{x(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx}{c^2d}$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x^2(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}\right.}{c^4d^2}$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d^2} +$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d^2} +$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d^2} +$$

$$= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\sin^{-1}(cx)}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin^{-1}(cx))^2}{2bc^4d^2} +$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 334 vs. $2(155) = 310$.
time = 0.31, size = 334, normalized size = 2.15

$$\frac{\frac{b\sqrt{1-c^2x^2}}{-1+cx} + \frac{b\sqrt{1-c^2x^2}}{1+cx} - \frac{2a}{-1+c^2x^2} + 4ib\pi\text{ArcSin}(cx) + \frac{b\text{ArcSin}(cx)}{1-cx} + \frac{b\text{ArcSin}(cx)}{1+cx} - 2ib\text{ArcSin}(cx)^2 + 8b\pi\log\left(1+e^{-i\text{ArcSin}(cx)}\right) + 2b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 4b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right) - 2b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + 4b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + 2a\log(1-c^2x^2) - 8b\pi\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) + 2b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - 2b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - 4ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right) - 4ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{4c^4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((b*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2*a)
/(-1 + c^2*x^2) + (4*I)*b*Pi*ArcSin[c*x] + (b*ArcSin[c*x])/(1 - c*x) + (b*A
rcSin[c*x])/(1 + c*x) - (2*I)*b*ArcSin[c*x]^2 + 8*b*Pi*Log[1 + E^((-I)*ArcS
in[c*x])] + 2*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]*Log[1 - I
*E^(I*ArcSin[c*x])] - 2*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]
*Log[1 + I*E^(I*ArcSin[c*x])] + 2*a*Log[1 - c^2*x^2] - 8*b*Pi*Log[Cos[ArcSi
n[c*x]/2]] + 2*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 2*b*Pi*Log[Sin[(Pi
+ 2*ArcSin[c*x])/4]] - (4*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*b
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(4*c^4*d^2)
```

Maple [**A**]
time = 0.32, size = 226, normalized size = 1.46

method	result

derivativedivides	$\frac{\frac{a}{4d^2(cx+1)}+\frac{a\ln(cx+1)}{2d^2}-\frac{a}{4d^2(cx-1)}+\frac{a\ln(cx-1)}{2d^2}-\frac{ib\arcsin(cx)^2}{2d^2}-\frac{ib\,c^2x^2}{2d^2\left(c^2x^2-1\right)}+\frac{bcx\sqrt{-c^2x^2+1}}{2d^2\left(c^2x^2-1\right)}-\frac{b\arcsin(cx)}{2d^2\left(c^2x^2-1\right)}+\frac{}{2d^2}}{c^4}$
default	$\frac{\frac{a}{4d^2(cx+1)}+\frac{a\ln(cx+1)}{2d^2}-\frac{a}{4d^2(cx-1)}+\frac{a\ln(cx-1)}{2d^2}-\frac{ib\arcsin(cx)^2}{2d^2}-\frac{ib\,c^2x^2}{2d^2\left(c^2x^2-1\right)}+\frac{bcx\sqrt{-c^2x^2+1}}{2d^2\left(c^2x^2-1\right)}-\frac{b\arcsin(cx)}{2d^2\left(c^2x^2-1\right)}+\frac{}{2d^2}}{c^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(1/4*a/d^2/(c*x+1)+1/2*a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)+1/2*a/d^2*ln
(c*x-1)-1/2*I*b/d^2*arcsin(c*x)^2-1/2*I*b/d^2/(c^2*x^2-1)*c^2*x^2+1/2*b/d^2
/(c^2*x^2-1)*c*x*(-c^2*x^2+1)^(1/2)-1/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)+1/2*I
*b/d^2/(c^2*x^2-1)+b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2
*I*b/d^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(1/(c^6*d^2*x^2 - c^4*d^2) - log(c^2*x^2 - 1)/(c^4*d^2)) + 1/2*((c^2
*x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + (c^2*x^
2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*(c^6*d^
2*x^2 - c^4*d^2)*integrate(1/2*((c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1/2*log
(-c*x + 1))*log(c*x + 1) + (c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x
 + 1))*log(-c*x + 1) - e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1)))/(c^9*d^2*x
^6 - 2*c^7*d^2*x^4 + c^5*d^2*x^2 + (c^7*d^2*x^4 - 2*c^5*d^2*x^2 + c^3*d^2)*
e^(log(c*x + 1) + log(-c*x + 1))), x) - arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))*b/(c^6*d^2*x^2 - c^4*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{ax^3}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^3 \operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**3/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**3*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.39 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=144

$$-\frac{b}{2c^3d^2\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))}{2c^2d^2(1-c^2x^2)}+\frac{i(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{c^3d^2}-\frac{ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)}{2c^3d^2}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)+I*(a+b*arcsin(c*x))*arctan(I*c
*x+(-c^2*x^2+1)^(1/2))/c^3/d^2-1/2*I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/
2)))/c^3/d^2+1/2*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^2-1/2*b/
c^3/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.09, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4791, 4749, 4266, 2317, 2438, 267}

$$\frac{i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3d^2}+\frac{x(a+b\text{ArcSin}(cx))}{2c^2d^2(1-c^2x^2)}-\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{2c^3d^2}+\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{2c^3d^2}-\frac{b}{2c^3d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*b/(c^3*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1
- c^2*x^2)) + (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d^2) -
 ((I/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + ((I/2)*b*PolyLog[
2, I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^2}\,dx = \frac{x(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{b\int\frac{x}{(1-c^2x^2)^{3/2}}\,dx}{2cd^2} - \frac{\int\frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} - \frac{\operatorname{Subst}\left(\int(a+bx)\sec(x)\,dx, x, \sin^{-1}(c\right.}{2c^3d^2}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2}$$

$$= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^3d^2}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 463 vs. $2(144) = 288$.
time = 0.11, size = 463, normalized size = 3.22

$$-\frac{ax}{2c^2d^2(-1+c^2x^2)} + \frac{a\log(1-cx)}{4c^3d^2} - \frac{a\log(1+cx)}{4c^3d^2} + \frac{b\left(\frac{\sqrt{1-c^2x^2}-\text{ArcSin}(cx)}{4c^3(-1+cx)} - \frac{\sqrt{1-c^2x^2}+\text{ArcSin}(cx)}{4c^2(c+c^2x)} + \frac{\frac{3i\pi\text{ArcSin}(cx)}{2c} - \frac{i\text{ArcSin}(cx)^2}{2c} + \frac{2\pi\log\left(1+e^{-i\text{ArcSin}(cx)}\right)}{c} - \frac{\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)}{c} + \frac{2\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)}{c} - \frac{2\pi\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{c} + \frac{\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)}{c} - \frac{2i\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)}{c}}{4c^2} - \frac{\frac{i\pi\text{ArcSin}(cx)}{2c} - \frac{i\text{ArcSin}(cx)^2}{2c} + \frac{2\pi\log\left(1+e^{-i\text{ArcSin}(cx)}\right)}{c} + \frac{\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)}{c} + \frac{2\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)}{c} - \frac{2\pi\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{c} - \frac{\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)}{c} - \frac{2i\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{c}}{4c^2}\right)}{d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*(a*x)/(c^2*d^2*(-1 + c^2*x^2)) + (a*Log[1 - c*x])/(4*c^3*d^2) - (a*Log
[1 + c*x])/(4*c^3*d^2) + (b*((Sqrt[1 - c^2*x^2] - ArcSin[c*x])/(4*c^3*(-1 +
 c*x)) - (Sqrt[1 - c^2*x^2] + ArcSin[c*x])/(4*c^2*(c + c^2*x)) + ((((3*I)/2
)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSi
n[c*x])])/c - (Pi*Log[1 + I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 +
I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(
Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c)/
(4*c^2) - (((I/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1
 + E^((-I)*ArcSin[c*x])])/c + (Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c
- (Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin
[c*x])])/c)/(4*c^2)))/d^2
```

Maple [A]
time = 0.19, size = 238, normalized size = 1.65

method	result
derivativedivides	$-\frac{a}{4d^2(cx+1)}-\frac{a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}+\frac{a\ln(cx-1)}{4d^2}-\frac{b\arcsin(cx)cx}{2d^2\left(c^2x^2-1\right)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2\left(c^2x^2-1\right)}+\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x\right.\right.}}{2d^2}$
default	$-\frac{a}{4d^2(cx+1)}-\frac{a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}+\frac{a\ln(cx-1)}{4d^2}-\frac{b\arcsin(cx)cx}{2d^2\left(c^2x^2-1\right)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2\left(c^2x^2-1\right)}+\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x\right.\right.}}{2d^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-1/4*a/d^2/(c*x+1)-1/4*a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)+1/4*a/d^2*l
n(c*x-1)-1/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+1/2*b/d^2/(c^2*x^2-1)*(-c^2*
x^2+1)^(1/2)+1/2*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*b
/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*I*b/d^2*dilog(1+I*(
I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*I*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^4*d^2*x^2 - c^2*d^2) + log(c*x + 1)/(c^3*d^2) - log(c*x - 1)
/(c^3*d^2)) - 1/4*(2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (c^2*
x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (c^2*x^2
 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 4*(c^5*d^2
*x^2 - c^3*d^2)*integrate(1/4*(2*c*x + (c^2*x^2 - 1)*log(c*x + 1) - (c^2*x^
2 - 1)*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^2*x^4 - 2*c^4*d^2
*x^2 + c^2*d^2), x))*b/(c^5*d^2*x^2 - c^3*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{ax^2}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^2\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**2*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.40 $\int \frac{x(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=57

$$-\frac{bx}{2cd^2\sqrt{1-c^2x^2}}+\frac{a+b\text{ArcSin}(cx)}{2c^2d^2\left(1-c^2x^2\right)}$$

```
[Out] 1/2*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)-1/2*b*x/c/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}=0.087$, Rules used = {4767, 197}

$$\frac{a+b\text{ArcSin}(cx)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{bx}{2cd^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*(b*x)/(c*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*c^2*d^2*(1 -
c^2*x^2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^2}\,dx &= \frac{a+b\sin^{-1}(cx)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{b\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^2}\\ &= -\frac{bx}{2cd^2\sqrt{1-c^2x^2}}+\frac{a+b\sin^{-1}(cx)}{2c^2d^2\left(1-c^2x^2\right)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 50, normalized size = 0.88

$$\frac{a - bcx\sqrt{1 - c^2x^2} + b\text{ArcSin}(cx)}{2c^2d^2 - 2c^4d^2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (a - b*c*x*Sqrt[1 - c^2*x^2] + b*ArcSin[c*x])/(2*c^2*d^2 - 2*c^4*d^2*x^2)
```

Maple [A]
time = 0.07, size = 98, normalized size = 1.72

method	result	size
derivativedivides	$\frac{-\frac{a}{2d^2(c^2x^2-1)}+\frac{b\left(-\frac{\arcsin(cx)}{2(c^2x^2-1)}+\frac{\sqrt{-(cx+1)^2+2cx+2}}{4cx+4}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{4cx-4}\right)}{d^2}}{c^2}$	98
default	$\frac{-\frac{a}{2d^2(c^2x^2-1)}+\frac{b\left(-\frac{\arcsin(cx)}{2(c^2x^2-1)}+\frac{\sqrt{-(cx+1)^2+2cx+2}}{4cx+4}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{4cx-4}\right)}{d^2}}{c^2}$	98

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/2*a/d^2/(c^2*x^2-1)+b/d^2*(-1/2/(c^2*x^2-1)*arcsin(c*x)+1/4/(c*x+
1)*(-(c*x+1)^2+2*c*x+2)^(1/2)+1/4/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 136 vs. 2(50) = 100.
time = 0.51, size = 136, normalized size = 2.39

$$\frac{1}{4}\left(\left(\frac{\sqrt{-c^2x^2+1}\,c^2d^2}{c^7d^4x+c^6d^4}+\frac{\sqrt{-c^2x^2+1}\,c^2d^2}{c^7d^4x-c^6d^4}\right)c^2-\frac{2\arcsin(cx)}{c^4d^2x^2-c^2d^2}\right)b-\frac{a}{2\,(c^4d^2x^2-c^2d^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/4*((sqrt(-c^2*x^2 + 1)*c^2*d^2/(c^7*d^4*x + c^6*d^4) + sqrt(-c^2*x^2 + 1)
*c^2*d^2/(c^7*d^4*x - c^6*d^4))*c^2 - 2*arcsin(c*x)/(c^4*d^2*x^2 - c^2*d^2)
)*b - 1/2*a/(c^4*d^2*x^2 - c^2*d^2)
```

Fricas [A]
time = 3.53, size = 55, normalized size = 0.96

$$-\frac{ac^2x^2 - \sqrt{-c^2x^2+1}\,bcx + b\arcsin{(cx)}}{2\,(c^4d^2x^2 - c^2d^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(a*c^2*x^2 - sqrt(-c^2*x^2 + 1)*b*c*x + b*arcsin(c*x))/(c^4*d^2*x^2 -
c^2*d^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{ax}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx\operatorname{asin}{(cx)}}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x*asin(c*x)/(c
**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [A]
time = 0.41, size = 89, normalized size = 1.56

$$-\frac{bx^2\arcsin{(cx)}}{2\,(c^2x^2-1)d^2} - \frac{ax^2}{2\,(c^2x^2-1)d^2} - \frac{bx}{2\sqrt{-c^2x^2+1}\,cd^2} + \frac{b\arcsin{(cx)}}{2\,c^2d^2} + \frac{a}{2\,c^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*b*x^2*arcsin(c*x)/((c^2*x^2 - 1)*d^2) - 1/2*a*x^2/((c^2*x^2 - 1)*d^2)
- 1/2*b*x/(sqrt(-c^2*x^2 + 1)*c*d^2) + 1/2*b*arcsin(c*x)/(c^2*d^2) + 1/2*a/
(c^2*d^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,(a+b\operatorname{asin}(c\,x))}{{(d-c^2\,d\,x^2)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.41 $\int \frac{a+b\text{ArcSin}(cx)}{(d-c^2dx^2)^2} dx$

Optimal. Leaf size=141

$$-\frac{b}{2cd^2\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))}{2d^2(1-c^2x^2)}-\frac{i(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{cd^2}+\frac{ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)}{2cd^2}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-I*(a+b*arcsin(c*x))*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))/c/d^2+1/2*I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c
/d^2-1/2*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-1/2*b/c/d^2/(-c^
2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.07, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4747, 4749, 4266, 2317, 2438, 267}

$$-\frac{i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{cd^2}+\frac{x(a+b\text{ArcSin}(cx))}{2d^2(1-c^2x^2)}+\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{2cd^2}-\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{2cd^2}-\frac{b}{2cd^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*b/(c*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*
x^2)) - (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d^2) + ((I/2)*
b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - ((I/2)*b*PolyLog[2, I*E^(I*
ArcSin[c*x])])/(c*d^2)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^2}\,dx = \frac{x(a+b\sin^{-1}(cx))}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{2d^2} + \frac{\int \frac{a+b\sin^{-1}(cx)}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2d^2(1-c^2x^2)} + \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{2cd^2}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2d^2(1-c^2x^2)} - \frac{i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2d^2(1-c^2x^2)} - \frac{i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{2d^2(1-c^2x^2)} - \frac{i(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 334 vs. 2(141) = 282.
time = 0.40, size = 334, normalized size = 2.37

$$-\frac{\frac{b\sqrt{1-c^2x^2}}{c-c^2x} + \frac{b\sqrt{1-c^2x^2}}{c+c^2x} + \frac{2ax}{-1+c^2x^2} + \frac{ib\pi\text{ArcSin}(cx)}{c} + \frac{b\text{ArcSin}(cx)}{c(-1+cx)} + \frac{b\text{ArcSin}(cx)}{c+c^2x} - \frac{b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)}{c} - \frac{2b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)}{c} - \frac{b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)}{c} + \frac{2b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)}{c} + \frac{a\log(1-cx)}{c} - \frac{a\log(1+cx)}{c} + \frac{b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)}{c} + \frac{b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)}{c} - \frac{2ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)}{c} + \frac{2ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{c}}{4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/4*((b*Sqrt[1 - c^2*x^2])/(c - c^2*x) + (b*Sqrt[1 - c^2*x^2])/(c + c^2*x)
 + (2*a*x)/(-1 + c^2*x^2) + (I*b*Pi*ArcSin[c*x])/c + (b*ArcSin[c*x])/(c*(-1
 + c*x)) + (b*ArcSin[c*x])/(c + c^2*x) - (b*Pi*Log[1 - I*E^(I*ArcSin[c*x])]
)/c - (2*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (b*Pi*Log[1 + I*E^
(I*ArcSin[c*x])])/c + (2*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c + (a
*Log[1 - c*x])/c - (a*Log[1 + c*x])/c + (b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])
/4]])/c + (b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*b*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/c + ((2*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/c)/d^
2
```

Maple [A]
time = 0.09, size = 238, normalized size = 1.69

method	result
derivativedivides	$\frac{-\frac{a}{4d^2(cx+1)}+\frac{a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}-\frac{a\ln(cx-1)}{4d^2}-\frac{b\arcsin(cx)cx}{2d^2(c^2x^2-1)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2(c^2x^2-1)}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2}\right.\right.}{2d^2}}{}$
default	$\frac{-\frac{a}{4d^2(cx+1)}+\frac{a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}-\frac{a\ln(cx-1)}{4d^2}-\frac{b\arcsin(cx)cx}{2d^2(c^2x^2-1)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2(c^2x^2-1)}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2}\right.\right.}{2d^2}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-1/4*a/d^2/(c*x+1)+1/4*a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)-1/4*a/d^2*ln(
c*x-1)-1/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+1/2*b/d^2/(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)-1/2*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*b/d
^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*I*b/d^2*dilog(1+I*(I*
c*x+(-c^2*x^2+1)^(1/2)))-1/2*I*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^2*d^2*x^2 - d^2) - log(c*x + 1)/(c*d^2) + log(c*x - 1)/(c*d^
2)) - 1/4*(2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (c^2*x^2 - 1)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + (c^2*x^2 - 1)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 4*(c^3*d^2*x^2 - c
```

```
*d^2)*integrate(-1/4*(2*c*x - (c^2*x^2 - 1)*log(c*x + 1) + (c^2*x^2 - 1)*lo
g(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^
2), x))*b/(c^3*d^2*x^2 - c*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*asin(c*x)/(c**4*
x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\operatorname{asin}(c\,x)}{{\left(d-c^2\,d\,x^2\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^2, x)
```

3.42 $\int \frac{a+b\text{ArcSin}(cx)}{x(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=122

$$-\frac{bcx}{2d^2\sqrt{1-c^2x^2}}+\frac{a+b\text{ArcSin}(cx)}{2d^2(1-c^2x^2)}-\frac{2(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)}{d^2}+\frac{ib\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)}{2d^2}-$$

```
[Out] 1/2*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-2*(a+b*arcsin(c*x))*arctanh((I*c*x+(
-c^2*x^2+1)^(1/2))^2)/d^2+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/
d^2-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b*c*x/d^2/(-c^2
*x^2+1)^(1/2)
```

Rubi [A]

time = 0.12, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4793, 4769, 4504, 4268, 2317, 2438, 197}

$$\frac{a+b\text{ArcSin}(cx)}{2d^2(1-c^2x^2)}-\frac{2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}+\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{bcx}{2d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/2*(b*c*x)/(d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*d^2*(1 - c^2*
x^2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + ((I/2)
*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((I/2)*b*PolyLog[2, E^((2*I)*A
rcSin[c*x])])/d^2
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^2}\,dx = \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{2d^2} + \frac{\int \frac{a+b\sin^{-1}(cx)}{x(d-c^2dx^2)}\,dx}{d}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} + \frac{\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} + \frac{2\text{Subst}\left(\int (a+bx)\csc(2x)\,dx, x, \sin^{-1}(cx)\right)}{d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{b\text{Su}}{}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} + \frac{(ib)}{}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{2d^2\left(1-c^2x^2\right)} - \frac{2\left(a+b\sin^{-1}(cx)\right)\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d^2} + \frac{ib\text{Li}}{}$$

Mathematica [A]
time = 0.25, size = 153, normalized size = 1.25

$$\frac{\frac{a}{1-c^2x^2} + 2a\log(x) - a\log\left(1-c^2x^2\right) + b\left(-\frac{cx}{\sqrt{1-c^2x^2}} + \frac{\text{ArcSin}(cx)}{1-c^2x^2} + 2\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right) - 2\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right) + i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right) - i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] (a/(1 - c^2*x^2) + 2*a*Log[x] - a*Log[1 - c^2*x^2] + b*(-((c*x)/Sqrt[1 - c^
2*x^2]) + ArcSin[c*x]/(1 - c^2*x^2) + 2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin
[c*x])] - 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] + I*PolyLog[2, -E^((
2*I)*ArcSin[c*x])] - I*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(2*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 334 vs. 2(140) = 280.
time = 0.22, size = 335, normalized size = 2.75

method	result
derivativedivides	$\frac{a}{4d^2(cx+1)} - \frac{a\ln(cx+1)}{2d^2} - \frac{a}{4d^2(cx-1)} - \frac{a\ln(cx-1)}{2d^2} + \frac{a\ln(cx)}{d^2} - \frac{ib\,c^2x^2}{2d^2(c^2x^2-1)} + \frac{bcx\sqrt{-c^2x^2+1}}{2d^2(c^2x^2-1)} - \frac{b}{2d}$
default	$\frac{a}{4d^2(cx+1)} - \frac{a\ln(cx+1)}{2d^2} - \frac{a}{4d^2(cx-1)} - \frac{a\ln(cx-1)}{2d^2} + \frac{a\ln(cx)}{d^2} - \frac{ib\,c^2x^2}{2d^2(c^2x^2-1)} + \frac{bcx\sqrt{-c^2x^2+1}}{2d^2(c^2x^2-1)} - \frac{b}{2d}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*a/d^2/(c*x+1)-1/2*a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)-1/2*a/d^2*ln(c*x-1)
+a/d^2*ln(c*x)-1/2*I*b/d^2/(c^2*x^2-1)*c^2*x^2+1/2*b/d^2/(c^2*x^2-1)*c*x*(-
c^2*x^2+1)^(1/2)-1/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)+1/2*I*b/d^2/(c^2*x^2-1)+
b/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b/d^2*polylog(2,-I*c*x-(
-c^2*x^2+1)^(1/2))-b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2
*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2+b/d^2*arcsin(c*x)*ln(1-I*
c*x-(-c^2*x^2+1)^(1/2))-I*b/d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(1/(c^2*d^2*x^2 - d^2) + log(c*x + 1)/d^2 + log(c*x - 1)/d^2 - 2*log
(x)/d^2) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*
x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a}{c^4x^5-2c^2x^3+x}\,dx + \int \frac{b\operatorname{asin}(cx)}{c^4x^5-2c^2x^3+x}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(b*asin(c*x)/(c**4*
x**5 - 2*c**2*x**3 + x), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^2), x)
```

3.43 $\int \frac{a+b\text{ArcSin}(cx)}{x^2(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=186

$$-\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\text{ArcSin}(cx)}{d^2x(1-c^2x^2)}+\frac{3c^2x(a+b\text{ArcSin}(cx))}{2d^2(1-c^2x^2)}-\frac{3ic(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{d^2}-\ b$$

```
[Out] (-a-b*arcsin(c*x))/d^2/x/(-c^2*x^2+1)+3/2*c^2*x*(a+b*arcsin(c*x))/d^2/(-c^2
*x^2+1)-3*I*c*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-b*c*ar
ctanh((-c^2*x^2+1)^(1/2))/d^2+3/2*I*b*c*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))/d^2-3/2*I*b*c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-1/2*b*c/d^2
/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.440$, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214}

$$-\frac{3ic\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}+\frac{3c^2x(a+b\text{ArcSin}(cx))}{2d^2(1-c^2x^2)}-\frac{a+b\text{ArcSin}(cx)}{d^2x(1-c^2x^2)}+\frac{3ibc\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{3ibc\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/2*(b*c)/(d^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(d^2*x*(1 - c^2*x^
2)) + (3*c^2*x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - ((3*I)*c*(a + b
*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (b*c*ArcTanh[Sqrt[1 - c^2*x^
2]])/d^2 + (((3*I)/2)*b*c*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - (((3*I)
/2)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
```

```
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx &= -\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}+\left(3c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2}\\
&= -\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}+\frac{(bc)\text{Subst}\left(\int \frac{1}{x\left(1-c^2x\right)^{3/2}}\,dx,x,x^2\right)}{2d^2}-\frac{(3\cdots}{\cdots}\\
&= -\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}+\frac{(3c)\text{Subst}\left(\int (a+bx\cdots\right.}{\cdots}\\
&= -\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{3ic\left(a+b\sin^{-1}(cx)\right)\cdots}{d\cdots}\\
&= -\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{3ic\left(a+b\sin^{-1}(cx)\right)\cdots}{d\cdots}\\
&= -\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x\left(a+b\sin^{-1}(cx)\right)}{2d^2\left(1-c^2x^2\right)}-\frac{3ic\left(a+b\sin^{-1}(cx)\right)\cdots}{d\cdots}
\end{aligned}$$

Mathematica [A]
time = 0.51, size = 348, normalized size = 1.87

$$-\frac{\frac{4a}{x}+\frac{bc\sqrt{1-c^2x^2}}{1-cx}+\frac{bc\sqrt{1-c^2x^2}}{1+cx}+\frac{2ac^2x}{-1+c^2x^2}+3ibc\pi\text{ArcSin}(cx)+\frac{4b\text{ArcSin}(cx)}{x}+\frac{bc\text{ArcSin}(cx)}{-1+cx}+\frac{bc\text{ArcSin}(cx)}{1+cx}+4bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-3bc\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-6bc\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-3bc\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+6bc\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+3ac\log(1-cx)-3ac\log(1+cx)+3bc\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+3bc\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-6ibc\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+6ibc\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/4*((4*a)/x + (b*c*Sqrt[1 - c^2*x^2])/(1 - c*x) + (b*c*Sqrt[1 - c^2*x^2])
/(1 + c*x) + (2*a*c^2*x)/(-1 + c^2*x^2) + (3*I)*b*c*Pi*ArcSin[c*x] + (4*b*A
rcSin[c*x])/x + (b*c*ArcSin[c*x])/(-1 + c*x) + (b*c*ArcSin[c*x])/(1 + c*x)
+ 4*b*c*ArcTanh[Sqrt[1 - c^2*x^2]] - 3*b*c*Pi*Log[1 - I*E^(I*ArcSin[c*x])]
- 6*b*c*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*b*c*Pi*Log[1 + I*E^(I*
ArcSin[c*x])] + 6*b*c*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a*c*Log[
1 - c*x] - 3*a*c*Log[1 + c*x] + 3*b*c*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
+ 3*b*c*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*b*c*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])] + (6*I)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Maple [A]
time = 0.21, size = 325, normalized size = 1.75

method	result
derivativedivides	$c\left(-\frac{a}{4d^2(cx+1)}+\frac{3a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}-\frac{3a\ln(cx-1)}{4d^2}-\frac{a}{d^2cx}-\frac{3b\arcsin(cx)cx}{2d^2(c^2x^2-1)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2(c^2x^2-1)}\right.$
default	$c\left(-\frac{a}{4d^2(cx+1)}+\frac{3a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}-\frac{3a\ln(cx-1)}{4d^2}-\frac{a}{d^2cx}-\frac{3b\arcsin(cx)cx}{2d^2(c^2x^2-1)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-1/4*a/d^2/(c*x+1)+3/4*a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)-3/4*a/d^2*ln(c*
x-1)-a/d^2/c/x-3/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+1/2*b/d^2/(c^2*x^2-1)*
(-c^2*x^2+1)^(1/2)+b/d^2/c/x/(c^2*x^2-1)*arcsin(c*x)+b/d^2*ln(I*c*x+(-c^2*x
^2+1)^(1/2)-1)-b/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3/2*b/d^2*arcsin(c*x)*l
n(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2
*x^2+1)^(1/2)))-3/2*I*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*I*b/d
^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*(3*c^2*x^2 - 2)/(c^2*d^2*x^3 - d^2*x) - 3*c*log(c*x + 1)/d^2 + 3*
c*log(c*x - 1)/d^2) + 1/4*(3*(c^3*x^3 - c*x)*arctan2(c*x, sqrt(c*x + 1)*sqr
```

```
t(-c*x + 1))*log(c*x + 1) - 3*(c^3*x^3 - c*x)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))*log(-c*x + 1) - 2*(3*c^2*x^2 - 2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + 4*(c^2*d^2*x^3 - d^2*x)*integrate(-1/4*(6*c^3*x^2 - 3*(c^
4*x^3 - c^2*x)*log(c*x + 1) + 3*(c^4*x^3 - c^2*x)*log(-c*x + 1) - 4*c)*sqrt
(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x))*b/(c^2*
d^2*x^3 - d^2*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a}{c^4x^6-2c^2x^4+x^2}\,dx + \int \frac{b\,\mathrm{asin}\,(cx)}{c^4x^6-2c^2x^4+x^2}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(b*asin(c*x)/(c*
*4*x**6 - 2*c**2*x**4 + x**2), x))/d**2
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,{\left(d-c^2\,d\,x^2\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^2), x)
```

3.44 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=159

$$-\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\text{ArcSin}(cx))}{d^2(1-c^2x^2)}-\frac{a+b\text{ArcSin}(cx)}{2d^2x^2(1-c^2x^2)}-\frac{4c^2(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)}{d^2}+\frac{ibc}{}$$

```
[Out] c^2*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)+1/2*(-a-b*arcsin(c*x))/d^2/x^2/(-c^2
*x^2+1)-4*c^2*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2+I
*b*c^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-I*b*c^2*polylog(2,(I*c*
x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b*c/d^2/x/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4789, 4793, 4769, 4504, 4268, 2317, 2438, 197, 277}

$$\frac{c^2(a+b\text{ArcSin}(cx))}{d^2(1-c^2x^2)}-\frac{a+b\text{ArcSin}(cx)}{2d^2x^2(1-c^2x^2)}-\frac{4c^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}+\frac{ibc^2\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{d^2}-\frac{ibc^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{d^2}-\frac{bc}{2d^2x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/2*(b*c)/(d^2*x*Sqrt[1 - c^2*x^2]) + (c^2*(a + b*ArcSin[c*x]))/(d^2*(1 -
c^2*x^2)) - (a + b*ArcSin[c*x])/(2*d^2*x^2*(1 - c^2*x^2)) - (4*c^2*(a + b*A
rcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (I*b*c^2*PolyLog[2, -E^((
2*I)*ArcSin[c*x])])/d^2 - (I*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^2}\,dx &= -\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}+\left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^2}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\sin^{-1}(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}+\frac{\left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)}\,dx}{d}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\sin^{-1}(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}+\frac{\left(2c^2\right)\text{Subst}\left(\int (a+bx\right.}{}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\sin^{-1}(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}+\frac{\left(4c^2\right)\text{Subst}\left(\int (a+bx\right.}{}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\sin^{-1}(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}-\frac{4c^2(a+b\sin^{-1}(cx))\,t}{d^2}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\sin^{-1}(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}-\frac{4c^2(a+b\sin^{-1}(cx))\,t}{d^2}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\sin^{-1}(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\sin^{-1}(cx)}{2d^2x^2\left(1-c^2x^2\right)}-\frac{4c^2(a+b\sin^{-1}(cx))\,t}{d^2}
\end{aligned}
$$

Mathematica [A]
time = 0.50, size = 213, normalized size = 1.34

$$
-\frac{\frac{a}{x^2}+\frac{bc^3x}{\sqrt{1-c^2x^2}}+\frac{bc\sqrt{1-c^2x^2}}{x}+\frac{ac^2}{-1+c^2x^2}+\frac{b\,\text{ArcSin}(cx)}{x^2}+\frac{bc^2\,\text{ArcSin}(cx)}{-1+c^2x^2}-4bc^2\,\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+4bc^2\,\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-4ac^2\log(x)+2ac^2\log\left(1-c^2x^2\right)-2ibc^2\,\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)+2ibc^2\,\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)}{2d^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/2*(a/x^2 + (b*c^3*x)/Sqrt[1 - c^2*x^2] + (b*c*Sqrt[1 - c^2*x^2])/x + (a*
c^2)/(-1 + c^2*x^2) + (b*ArcSin[c*x])/x^2 + (b*c^2*ArcSin[c*x])/(-1 + c^2*x
^2) - 4*b*c^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 4*b*c^2*ArcSin[c
*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - 4*a*c^2*Log[x] + 2*a*c^2*Log[1 - c^2*x
^2] - (2*I)*b*c^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + (2*I)*b*c^2*PolyLog[
2, E^((2*I)*ArcSin[c*x])])/d^2
```

Maple [A]
time = 0.21, size = 343, normalized size = 2.16

method	result

derivativedivides	$c^2\left(\frac{a}{4d^2(cx+1)}-\frac{a\ln(cx+1)}{d^2}-\frac{a}{4d^2(cx-1)}-\frac{a\ln(cx-1)}{d^2}-\frac{a}{2d^2c^2x^2}+\frac{2a\ln(cx)}{d^2}-\frac{b\arcsin(cx)}{d^2(c^2x^2-1)}+\frac{b\sqrt{-c^2}}{2d^2cx(}\right.$
default	$c^2\left(\frac{a}{4d^2(cx+1)}-\frac{a\ln(cx+1)}{d^2}-\frac{a}{4d^2(cx-1)}-\frac{a\ln(cx-1)}{d^2}-\frac{a}{2d^2c^2x^2}+\frac{2a\ln(cx)}{d^2}-\frac{b\arcsin(cx)}{d^2(c^2x^2-1)}+\frac{b\sqrt{-c^2}}{2d^2cx(}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(1/4*a/d^2/(c*x+1)-a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)-a/d^2*ln(c*x-1)-1/
2*a/d^2/c^2/x^2+2*a/d^2*ln(c*x)-b/d^2/(c^2*x^2-1)*arcsin(c*x)+1/2*b/d^2/c/x
/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+1/2*b/d^2/c^2/x^2/(c^2*x^2-1)*arcsin(c*x)-2
*b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*b/d^2*arcsin(c*x)*l
n(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*b/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(
1/2))-2*I*b/d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+I*b/d^2*polylog(2,-(I*
c*x+(-c^2*x^2+1)^(1/2))^2)-2*I*b/d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*c^2*log(c*x + 1)/d^2 + 2*c^2*log(c*x - 1)/d^2 - 4*c^2*log(x)/d^2
+ (2*c^2*x^2 - 1)/(c^2*d^2*x^4 - d^2*x^2)) + b*integrate(arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a}{c^4x^7-2c^2x^5+x^3}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^4x^7-2c^2x^5+x^3}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(b*asin(c*x)/(c*
*4*x**7 - 2*c**2*x**5 + x**3), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^2),x)
```

```
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^2), x)
```

3.45 $\int \frac{a+b\text{ArcSin}(cx)}{x^4(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=259

$$-\frac{bc^3}{3d^2\sqrt{1-c^2x^2}}-\frac{bc}{6d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\text{ArcSin}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+b\text{ArcSin}(cx))}{3d^2x\left(1-c^2x^2\right)}+\frac{5c^4x(a+b\text{ArcSin}(cx))}{2d^2\left(1-c^2x^2\right)}-5$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d^2/x^3/(-c^2*x^2+1)-5/3*c^2*(a+b*arcsin(c*x))/d^2/x
/(-c^2*x^2+1)+5/2*c^4*x*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-5*I*c^3*(a+b*arc
sin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-13/6*b*c^3*arctanh((-c^2*x^2
+1)^(1/2))/d^2+5/2*I*b*c^3*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-5/2
*I*b*c^3*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-1/3*b*c^3/d^2/(-c^2*x^
2+1)^(1/2)-1/6*b*c/d^2/x^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.22, antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.480$, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214, 44}

$$-\frac{5ic^3\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{5c^2(a+b\text{ArcSin}(cx))}{3d^2x\left(1-c^2x^2\right)}-\frac{a+b\text{ArcSin}(cx)}{3d^2x^3\left(1-c^2x^2\right)}+\frac{5c^4x(a+b\text{ArcSin}(cx))}{2d^2\left(1-c^2x^2\right)}+\frac{5ibc^3\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{5ibc^3\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{bc}{6d^2x^2\sqrt{1-c^2x^2}}-\frac{bc^3}{3d^2\sqrt{1-c^2x^2}}-\frac{13bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/3*(b*c^3)/(d^2*Sqrt[1 - c^2*x^2]) - (b*c)/(6*d^2*x^2*Sqrt[1 - c^2*x^2])
- (a + b*ArcSin[c*x])/(3*d^2*x^3*(1 - c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x]
))/(3*d^2*x*(1 - c^2*x^2)) + (5*c^4*x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*
x^2)) - ((5*I)*c^3*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (13
*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d^2) + (((5*I)/2)*b*c^3*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])])/d^2 - (((5*I)/2)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x]
)])/d^2
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
```

```
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx = -\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}+\frac{1}{3}\left(5c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\int \frac{1}{x^3(1-c^2x^2)^{3/2}}\,dx}{3d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+b\sin^{-1}(cx))}{3d^2x\left(1-c^2x^2\right)}+\left(5c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\text{Subst}}{}$$

$$= \frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+b\sin^{-1}(cx))}{3d^2x\left(1-c^2x^2\right)}+\frac{5c^4x(a+b\sin^{-1}(cx))}{2d^2\left(1-c^2x^2\right)}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+}{3d^2x}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+}{3d^2x}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+}{3d^2x}$$

$$= -\frac{5bc^3}{6d^2\sqrt{1-c^2x^2}}+\frac{bc}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x^2}-\frac{a+b\sin^{-1}(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+}{3d^2x}$$

Mathematica [A]
time = 0.61, size = 426, normalized size = 1.64

$$-\frac{\frac{4a}{x^3}+\frac{24ac^2}{x}+\frac{2bc\sqrt{1-c^2x^2}}{x^2}-\frac{3bc^3\sqrt{1-c^2x^2}}{-1+cx}+\frac{3bc^3\sqrt{1-c^2x^2}}{1+cx}+\frac{6ac^4x}{-1+c^2x^2}+15ibc^3\pi\text{ArcSin}(cx)+\frac{4b\text{ArcSin}(cx)}{x^3}+\frac{24bc^2\text{ArcSin}(cx)}{x}+\frac{3bc^3\text{ArcSin}(cx)}{-1+cx}+\frac{3bc^3\text{ArcSin}(cx)}{1+cx}+26bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-15bc^3\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-30bc^3\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-15bc^3\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+30bc^3\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+15ac^3\log(1-cx)-15ac^3\log(1+cx)+15bc^3\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+15bc^3\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-30ibc^3\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+30ibc^3\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{12d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/12*((4*a)/x^3 + (24*a*c^2)/x + (2*b*c*Sqrt[1 - c^2*x^2])/x^2 - (3*b*c^3*
Sqrt[1 - c^2*x^2])/(-1 + c*x) + (3*b*c^3*Sqrt[1 - c^2*x^2])/(1 + c*x) + (6*
a*c^4*x)/(-1 + c^2*x^2) + (15*I)*b*c^3*Pi*ArcSin[c*x] + (4*b*ArcSin[c*x])/x
^3 + (24*b*c^2*ArcSin[c*x])/x + (3*b*c^3*ArcSin[c*x])/(-1 + c*x) + (3*b*c^3
*ArcSin[c*x])/(1 + c*x) + 26*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 15*b*c^3*Pi
*Log[1 - I*E^(I*ArcSin[c*x])] - 30*b*c^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[
c*x])] - 15*b*c^3*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 30*b*c^3*ArcSin[c*x]*Lo
g[1 + I*E^(I*ArcSin[c*x])] + 15*a*c^3*Log[1 - c*x] - 15*a*c^3*Log[1 + c*x]
+ 15*b*c^3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 15*b*c^3*Pi*Log[Sin[(Pi +
 2*ArcSin[c*x])/4]] - (30*I)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (30
*I)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Maple [A]
time = 0.24, size = 403, normalized size = 1.56

method	result
derivativedivides	$c^3\left(-\frac{a}{4d^2(cx+1)}+\frac{5a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}-\frac{5a\ln(cx-1)}{4d^2}-\frac{a}{3d^2c^3x^3}-\frac{2a}{d^2cx}-\frac{5b\arcsin(cx)cx}{2d^2(c^2x^2-1)}+\frac{b\sqrt{\cdot}}{3\cdot}\right.$
default	$c^3\left(-\frac{a}{4d^2(cx+1)}+\frac{5a\ln(cx+1)}{4d^2}-\frac{a}{4d^2(cx-1)}-\frac{5a\ln(cx-1)}{4d^2}-\frac{a}{3d^2c^3x^3}-\frac{2a}{d^2cx}-\frac{5b\arcsin(cx)cx}{2d^2(c^2x^2-1)}+\frac{b\sqrt{\cdot}}{3\cdot}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-1/4*a/d^2/(c*x+1)+5/4*a/d^2*ln(c*x+1)-1/4*a/d^2/(c*x-1)-5/4*a/d^2*ln(
c*x-1)-1/3*a/d^2/c^3/x^3-2*a/d^2/c/x-5/2*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+
1/3*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+5/3*b/d^2/c/x/(c^2*x^2-1)*arcsin(c
*x)+1/6*b/d^2/c^2/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+1/3*b/d^2/c^3/x^3/(c^2
*x^2-1)*arcsin(c*x)+13/6*b/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-13/6*b/d^2*ln
(1+I*c*x+(-c^2*x^2+1)^(1/2))-5/2*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+
1)^(1/2)))+5/2*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/2*I*b
/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5/2*I*b/d^2*dilog(1-I*(I*c*x+(-c
^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/12*(15*c^3*log(c*x + 1)/d^2 - 15*c^3*log(c*x - 1)/d^2 - 2*(15*c^4*x^4 - 1
0*c^2*x^2 - 2)/(c^2*d^2*x^5 - d^2*x^3))*a + 1/12*(15*(c^5*x^5 - c^3*x^3)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(c^5*x^5 - c^3*x
^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(15*c^4*x^
4 - 10*c^2*x^2 - 2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 12*(c^2*d^
2*x^5 - d^2*x^3)*integrate(-1/12*(30*c^5*x^4 - 20*c^3*x^2 - 15*(c^6*x^5 - c
^4*x^3)*log(c*x + 1) + 15*(c^6*x^5 - c^4*x^3)*log(-c*x + 1) - 4*c)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x))*b/(c^2*d^
2*x^5 - d^2*x^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a}{c^4x^8-2c^2x^6+x^4}\,dx + \int \frac{b\operatorname{asin}(cx)}{c^4x^8-2c^2x^6+x^4}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(b*asin(c*x)/(c*
*4*x**8 - 2*c**2*x**6 + x**4), x))/d**2
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x^4), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\operatorname{asin}(c\,x)}{x^4\,{\left(d-c^2\,d\,x^2\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^2),x)
```

```
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^2), x)
```

3.46 $\int \frac{x^4(a+b\textbf{ArcSin}(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=204

$$-\frac{b}{12c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b}{8c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3(a+b\text{ArcSin}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x(a+b\text{ArcSin}(cx))}{8c^4d^3\left(1-c^2x^2\right)}-\frac{3i(a+b\text{ArcSin}(cx$$

```
[Out] -1/12*b/c^5/d^3/(-c^2*x^2+1)^(3/2)+1/4*x^3*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*
x^2+1)^2-3/8*x*(a+b*arcsin(c*x))/c^4/d^3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x
))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^5/d^3+3/8*I*b*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/c^5/d^3-3/8*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c
^5/d^3+5/8*b/c^5/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4791, 4749, 4266, 2317, 2438, 267, 272, 45}

$$-\frac{3i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4c^5d^3}+\frac{x^3(a+b\text{ArcSin}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x(a+b\text{ArcSin}(cx))}{8c^4d^3\left(1-c^2x^2\right)}+\frac{3ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{8c^5d^3}-\frac{3ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{8c^5d^3}+\frac{5b}{8c^5d^3\sqrt{1-c^2x^2}}-\frac{b}{12c^5d^3\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*b/(c^5*d^3*(1 - c^2*x^2)^(3/2)) + (5*b)/(8*c^5*d^3*Sqrt[1 - c^2*x^2])
 + (x^3*(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*ArcS
in[c*x]))/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan
[E^(I*ArcSin[c*x])])/(c^5*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c
*x])])/(c^5*d^3) - (((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^3}\,dx = \frac{x^3(a+b\sin^{-1}(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{b\int \frac{x^3}{(1-c^2x^2)^{5/2}}\,dx}{4cd^3} - \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^2}\,dx}{4c^2d}$$

$$= \frac{x^3(a+b\sin^{-1}(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\sin^{-1}(cx))}{8c^4d^3(1-c^2x^2)} + \frac{(3b)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{8c^3d^3} - \frac{b\text{Subst}\Big(\int \ldots$$

$$= \frac{3b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\sin^{-1}(cx))}{8c^4d^3(1-c^2x^2)} + \frac{3\text{Subst}\Big(\int(a+\ldots}{}$$

$$= -\frac{b}{12c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\sin \ldots}{8c^4d^3(1-\ldots}$$

$$= -\frac{b}{12c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\sin \ldots}{8c^4d^3(1-\ldots}$$

$$= -\frac{b}{12c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\sin \ldots}{8c^4d^3(1-\ldots}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 445 vs. 2(204) = 408.
time = 0.62, size = 445, normalized size = 2.18

$$\frac{-\frac{2b\sqrt{1-c^2x^2}}{(-1+cx)^2} + \frac{bcx\sqrt{1-c^2x^2}}{(-1+cx)^2} - \frac{15b\sqrt{1-c^2x^2}}{-1+cx} - \frac{2b\sqrt{1-c^2x^2}}{(1+cx)^2} - \frac{bcx\sqrt{1-c^2x^2}}{(1+cx)^2} + \frac{15b\sqrt{1-c^2x^2}}{1+cx} + \frac{12acx}{(-1+c^2x^2)^2} + \frac{30acx}{-1+c^2x^2} - 9ib\pi\text{ArcSin}(cx) + \frac{3b\text{ArcSin}(cx)}{(-1+cx)^2} + \frac{15b\text{ArcSin}(cx)}{-1+cx} - \frac{3b\text{ArcSin}(cx)}{(1+cx)^2} + \frac{15b\text{ArcSin}(cx)}{1+cx} + 9b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 18b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 9b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right) - 18b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right) - 9a\log(1-cx) + 9a\log(1+cx) - 9b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - 9b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) + 18ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right) - 18ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{48c^5d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((-2*b*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 + (b*c*x*Sqrt[1 - c^2*x^2])/(-1 + c*
x)^2 - (15*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*b*Sqrt[1 - c^2*x^2])/(1 + c
*x)^2 - (b*c*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (15*b*Sqrt[1 - c^2*x^2])/(1
 + c*x) + (12*a*c*x)/(-1 + c^2*x^2)^2 + (30*a*c*x)/(-1 + c^2*x^2) - (9*I)*b
*Pi*ArcSin[c*x] + (3*b*ArcSin[c*x])/(-1 + c*x)^2 + (15*b*ArcSin[c*x])/(-1 +
 c*x) - (3*b*ArcSin[c*x])/(1 + c*x)^2 + (15*b*ArcSin[c*x])/(1 + c*x) + 9*b*
Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 18*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*
x])] + 9*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 18*b*ArcSin[c*x]*Log[1 + I*E^(
I*ArcSin[c*x])] - 9*a*Log[1 - c*x] + 9*a*Log[1 + c*x] - 9*b*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] - 9*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (18*I)*b*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (18*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x]
)])/(48*c^5*d^3)
```

Maple [A]
time = 0.40, size = 358, normalized size = 1.75

method	result
derivativedivides	$-\frac{a}{16d^3(cx+1)^2}+\frac{5a}{16d^3(cx+1)}+\frac{3a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}+\frac{5a}{16d^3(cx-1)}-\frac{3a\ln(cx-1)}{16d^3}+\frac{5b\arcsin(cx)c^3x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}-\frac{5b\,c^2x^2\sqrt{-c^2x}}{8d^3\left(c^4x^4-2c^2\right.}$
default	$-\frac{a}{16d^3(cx+1)^2}+\frac{5a}{16d^3(cx+1)}+\frac{3a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}+\frac{5a}{16d^3(cx-1)}-\frac{3a\ln(cx-1)}{16d^3}+\frac{5b\arcsin(cx)c^3x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}-\frac{5b\,c^2x^2\sqrt{-c^2x}}{8d^3\left(c^4x^4-2c^2\right.}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-1/16*a/d^3/(c*x+1)^2+5/16*a/d^3/(c*x+1)+3/16*a/d^3*ln(c*x+1)+1/16*a
/d^3/(c*x-1)^2+5/16*a/d^3/(c*x-1)-3/16*a/d^3*ln(c*x-1)+5/8*b/d^3/(c^4*x^4-2
*c^2*x^2+1)*arcsin(c*x)*c^3*x^3-5/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2*(-c
^2*x^2+1)^(1/2)-3/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c*x+13/24*b/d^3
/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-3/8*b/d^3*arcsin(c*x)*ln(1+I*(I*c
*x+(-c^2*x^2+1)^(1/2)))+3/8*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))+3/8*I*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*I*b/d^3*dilog(1
-I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a*(2*(5*c^2*x^3 - 3*x)/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 3*log
(c*x + 1)/(c^5*d^3) - 3*log(c*x - 1)/(c^5*d^3)) + 1/16*(3*(c^4*x^4 - 2*c^2*
x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^4*x
^4 - 2*c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1
) + 2*(5*c^3*x^3 - 3*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(
c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)*integrate(1/16*(10*c^3*x^3 - 6*c*x +
 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log(c*x + 1) - 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log
(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^10*d^3*x^6 - 3*c^8*d^3*x^4 + 3*
c^6*d^3*x^2 - c^4*d^3), x))*b/(c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*
d^3*x^2 - d^3), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^4}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{bx^4\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**4/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**4*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.47 $\int \frac{x^3(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=100

$$-\frac{bx^3}{12cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx}{4c^3d^3\sqrt{1-c^2x^2}}-\frac{b\text{ArcSin}(cx)}{4c^4d^3}+\frac{x^4(a+b\text{ArcSin}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

```
[Out] -1/12*b*x^3/c/d^3/(-c^2*x^2+1)^(3/2)-1/4*b*arcsin(c*x)/c^4/d^3+1/4*x^4*(a+b
*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+1/4*b*x/c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {4771, 294, 222}

$$\frac{x^4(a+b\text{ArcSin}(cx))}{4d^3\left(1-c^2x^2\right)^2}-\frac{b\text{ArcSin}(cx)}{4c^4d^3}-\frac{bx^3}{12cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx}{4c^3d^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*(b*x^3)/(c*d^3*(1 - c^2*x^2)^(3/2)) + (b*x)/(4*c^3*d^3*Sqrt[1 - c^2*x
^2]) - (b*ArcSin[c*x])/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x]))/(4*d^3*(1 -
c^2*x^2)^2)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
```

```
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^3}\,dx = \frac{x^4(a+b\sin^{-1}(cx))}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x^4}{(1-c^2x^2)^{5/2}}\,dx}{4d^3}$$
$$= -\frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}} + \frac{x^4(a+b\sin^{-1}(cx))}{4d^3(1-c^2x^2)^2} + \frac{b\int \frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{4cd^3}$$
$$= -\frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}} + \frac{bx}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x^4(a+b\sin^{-1}(cx))}{4d^3(1-c^2x^2)^2} - \frac{b\int \frac{1}{\sqrt{1-c^2}}}{4c^3d^3}$$
$$= -\frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}} + \frac{bx}{4c^3d^3\sqrt{1-c^2x^2}} - \frac{b\sin^{-1}(cx)}{4c^4d^3} + \frac{x^4(a+b\sin^{-1}(cx))}{4d^3(1-c^2x^2)^2}$$

Mathematica [A]
time = 0.05, size = 79, normalized size = 0.79

$$\frac{bcx(3-4c^2x^2)\sqrt{1-c^2x^2}+a(-3+6c^2x^2)+3b(-1+2c^2x^2)\,\mathrm{ArcSin}(cx)}{12c^4d^3(-1+c^2x^2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
[Out] (b*c*x*(3 - 4*c^2*x^2)*Sqrt[1 - c^2*x^2] + a*(-3 + 6*c^2*x^2) + 3*b*(-1 + 2
*c^2*x^2)*ArcSin[c*x])/(12*c^4*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 211 vs. 2(88) = 176.
time = 0.07, size = 212, normalized size = 2.12

method	result
derivativedivides	$-\frac{a\left(-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}\right)}{d^3} - \frac{b\left(-\frac{\arcsin(cx)}{16(cx+1)^2}+\frac{3\arcsin(cx)}{16(cx+1)}-\frac{\arcsin(cx)}{16(cx-1)^2}-\frac{3\arcsin(cx)}{16(cx-1)}+\frac{\sqrt{-(cx-}}{}\right.}{}$
default	$-\frac{a\left(-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}\right)}{d^3} - \frac{b\left(-\frac{\arcsin(cx)}{16(cx+1)^2}+\frac{3\arcsin(cx)}{16(cx+1)}-\frac{\arcsin(cx)}{16(cx-1)^2}-\frac{3\arcsin(cx)}{16(cx-1)}+\frac{\sqrt{-(cx-}}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-a/d^3*(-1/16/(c*x+1)^2+3/16/(c*x+1)-1/16/(c*x-1)^2-3/16/(c*x-1))-b/
d^3*(-1/16*arcsin(c*x)/(c*x+1)^2+3/16*arcsin(c*x)/(c*x+1)-1/16*arcsin(c*x)/
(c*x-1)^2-3/16*arcsin(c*x)/(c*x-1)+1/48/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2
)+1/6/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/6/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(
1/2)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(2*c^2*x^2 - 1)*a/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 1/4*((2*c^2
*x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 4*(c^8*d^3*x^4 - 2*c
^6*d^3*x^2 + c^4*d^3)*integrate(1/4*(2*c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1
/2*log(-c*x + 1))/(c^11*d^3*x^8 - 3*c^9*d^3*x^6 + 3*c^7*d^3*x^4 - c^5*d^3*x
^2 + (c^9*d^3*x^6 - 3*c^7*d^3*x^4 + 3*c^5*d^3*x^2 - c^3*d^3)*e^(log(c*x + 1
) + log(-c*x + 1))), x))*b/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)
```

Fricas [A]
time = 2.02, size = 91, normalized size = 0.91

$$\frac{3\,ac^4x^4 + 3\,(2\,bc^2x^2 - b)\arcsin(cx) - (4\,bc^3x^3 - 3\,bcx)\sqrt{-c^2x^2 + 1}}{12\,(c^8d^3x^4 - 2\,c^6d^3x^2 + c^4d^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*c^4*x^4 + 3*(2*b*c^2*x^2 - b)*arcsin(c*x) - (4*b*c^3*x^3 - 3*b*c*
x)*sqrt(-c^2*x^2 + 1))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^3}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{bx^3\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**3/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**3*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [A]
time = 0.44, size = 124, normalized size = 1.24

$$\frac{bx^4\arcsin(cx)}{4\,(c^2x^2-1)^2d^3}+\frac{ax^4}{4\,(c^2x^2-1)^2d^3}+\frac{bx^3}{12\,(c^2x^2-1)\sqrt{-c^2x^2+1}\,cd^3}+\frac{bx}{4\,\sqrt{-c^2x^2+1}\,c^3d^3}-\frac{b\arcsin(cx)}{4\,c^4d^3}-\frac{a}{4\,c^4d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b*x^4*arcsin(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a*x^4/((c^2*x^2 - 1)^2*d^
3) + 1/12*b*x^3/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b*x/(sqrt(-c
^2*x^2 + 1)*c^3*d^3) - 1/4*b*arcsin(c*x)/(c^4*d^3) - 1/4*a/(c^4*d^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.48 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=202

$$-\frac{b}{12c^3d^3(1-c^2x^2)^{3/2}}+\frac{b}{8c^3d^3\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))}{4c^2d^3(1-c^2x^2)^2}-\frac{x(a+b\text{ArcSin}(cx))}{8c^2d^3(1-c^2x^2)}+\frac{i(a+b\text{ArcSin}(cx))\text{Ar}}{4c^3d^3}$$

```
[Out] -1/12*b/c^3/d^3/(-c^2*x^2+1)^(3/2)+1/4*x*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*x^
2+1)^2-1/8*x*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*x^2+1)+1/4*I*(a+b*arcsin(c*x))
*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^3/d^3-1/8*I*b*polylog(2,-I*(I*c*x+(-c^2
*x^2+1)^(1/2)))/c^3/d^3+1/8*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3
/d^3+1/8*b/c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4791, 4747, 4749, 4266, 2317, 2438, 267}

$$\frac{i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4c^3d^3}-\frac{x(a+b\text{ArcSin}(cx))}{8c^2d^3(1-c^2x^2)}+\frac{x(a+b\text{ArcSin}(cx))}{4c^2d^3(1-c^2x^2)^2}-\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{8c^3d^3}+\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{8c^3d^3}+\frac{b}{8c^3d^3\sqrt{1-c^2x^2}}-\frac{b}{12c^3d^3(1-c^2x^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*b/(c^3*d^3*(1 - c^2*x^2)^(3/2)) + b/(8*c^3*d^3*Sqrt[1 - c^2*x^2]) + (
x*(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c*x])
)/(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin
[c*x])])/(c^3*d^3) - ((I/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3)
 + ((I/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^3}\,dx = \frac{x(a+b\sin^{-1}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{x}{(1-c^2x^2)^{5/2}}\,dx}{4cd^3} - \frac{\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^2}\,dx}{4c^2d}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{x(a+b\sin^{-1}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\sin^{-1}(cx))}{8c^2d^3\left(1-c^2x^2\right)} + \frac{b\int \frac{x}{(1-c^2x^2)^{3/}}}{8cd^3}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\sin^{-1}(}{8c^2d^3(1-c^2}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\sin^{-1}(}{8c^2d^3(1-c^2}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\sin^{-1}(}{8c^2d^3(1-c^2}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\sin^{-1}(}{8c^2d^3(1-c^2}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 445 vs. 2(202) = 404.
time = 0.46, size = 445, normalized size = 2.20

$$\frac{-\frac{2b\sqrt{1-c^2x^2}}{(-1+cx)^2}+\frac{bcx\sqrt{1-c^2x^2}}{(-1+cx)^2}-\frac{3b\sqrt{1-c^2x^2}}{-1+cx}-\frac{2b\sqrt{1-c^2x^2}}{(1+cx)^2}-\frac{bcx\sqrt{1-c^2x^2}}{(1+cx)^2}+\frac{3b\sqrt{1-c^2x^2}}{1+cx}+\frac{12acx}{(-1+c^2x^2)^2}+\frac{6acx}{-1+c^2x^2}+3ib\pi\text{ArcSin}(cx)+\frac{3b\text{ArcSin}(cx)}{(-1+cx)^2}+\frac{3b\text{ArcSin}(cx)}{-1+cx}-\frac{3b\text{ArcSin}(cx)}{(1+cx)^2}+\frac{3b\text{ArcSin}(cx)}{1+cx}-3b\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-6b\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-3b\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+6b\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+3a\log(1-cx)-3a\log(1+cx)+3b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+3b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-6ib\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+6ib\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{48c^3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((-2*b*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 + (b*c*x*Sqrt[1 - c^2*x^2])/(-1 + c*
x)^2 - (3*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*b*Sqrt[1 - c^2*x^2])/(1 + c*
x)^2 - (b*c*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (3*b*Sqrt[1 - c^2*x^2])/(1 +
 c*x) + (12*a*c*x)/(-1 + c^2*x^2)^2 + (6*a*c*x)/(-1 + c^2*x^2) + (3*I)*b*Pi
*ArcSin[c*x] + (3*b*ArcSin[c*x])/(-1 + c*x)^2 + (3*b*ArcSin[c*x])/(-1 + c*x
) - (3*b*ArcSin[c*x])/(1 + c*x)^2 + (3*b*ArcSin[c*x])/(1 + c*x) - 3*b*Pi*Lo
g[1 - I*E^(I*ArcSin[c*x])] - 6*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] -
 3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSi
n[c*x])] + 3*a*Log[1 - c*x] - 3*a*Log[1 + c*x] + 3*b*Pi*Log[-Cos[(Pi + 2*Ar
cSin[c*x])/4]] + 3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*b*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(48*c
^3*d^3)
```

Maple [**A**]
time = 0.30, size = 358, normalized size = 1.77

method	result
derivativedivides	$-\frac{a}{16d^3(cx+1)^2}+\frac{a}{16d^3(cx+1)}-\frac{a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}+\frac{a}{16d^3(cx-1)}+\frac{a\ln(cx-1)}{16d^3}+\frac{b\arcsin(cx)c^3x^3}{8d^3(c^4x^4-2c^2x^2+1)}-\frac{b\,c^2x^2\sqrt{-c^2x^2}}{8d^3(c^4x^4-2c^2x}$
default	$-\frac{a}{16d^3(cx+1)^2}+\frac{a}{16d^3(cx+1)}-\frac{a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}+\frac{a}{16d^3(cx-1)}+\frac{a\ln(cx-1)}{16d^3}+\frac{b\arcsin(cx)c^3x^3}{8d^3(c^4x^4-2c^2x^2+1)}-\frac{b\,c^2x^2\sqrt{-c^2x^2}}{8d^3(c^4x^4-2c^2x}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-1/16*a/d^3/(c*x+1)^2+1/16*a/d^3/(c*x+1)-1/16*a/d^3*ln(c*x+1)+1/16*a
/d^3/(c*x-1)^2+1/16*a/d^3/(c*x-1)+1/16*a/d^3*ln(c*x-1)+1/8*b/d^3/(c^4*x^4-2
*c^2*x^2+1)*arcsin(c*x)*c^3*x^3-1/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2*(-c
^2*x^2+1)^(1/2)+1/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c*x+1/24*b/d^3/
(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)+1/8*b/d^3*arcsin(c*x)*ln(1+I*(I*c*
x+(-c^2*x^2+1)^(1/2)))-1/8*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/
2)))-1/8*I*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/8*I*b/d^3*dilog(1-
I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a*(2*(c^2*x^3 + x)/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) - log(c*x +
 1)/(c^3*d^3) + log(c*x - 1)/(c^3*d^3)) - 1/16*((c^4*x^4 - 2*c^2*x^2 + 1)*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (c^4*x^4 - 2*c^2*x
^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(c^3*x
^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^7*d^3*x^4 - 2*
c^5*d^3*x^2 + c^3*d^3)*integrate(-1/16*(2*c^3*x^3 + 2*c*x - (c^4*x^4 - 2*c^
2*x^2 + 1)*log(c*x + 1) + (c^4*x^4 - 2*c^2*x^2 + 1)*log(-c*x + 1))*sqrt(c*x
 + 1)*sqrt(-c*x + 1)/(c^8*d^3*x^6 - 3*c^6*d^3*x^4 + 3*c^4*d^3*x^2 - c^2*d^3
), x))*b/(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^2*arcsin(c*x) + a*x^2)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*
d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^2}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{bx^2\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**2*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.49 $\int \frac{x(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=83

$$-\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}}-\frac{bx}{6cd^3\sqrt{1-c^2x^2}}+\frac{a+b\text{ArcSin}(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}$$

```
[Out] -1/12*b*x/c/d^3/(-c^2*x^2+1)^(3/2)+1/4*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*x^2+
1)^2-1/6*b*x/c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {4767, 198, 197}

$$\frac{a+b\text{ArcSin}(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{bx}{6cd^3\sqrt{1-c^2x^2}}-\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*(b*x)/(c*d^3*(1 - c^2*x^2)^(3/2)) - (b*x)/(6*c*d^3*Sqrt[1 - c^2*x^2])
 + (a + b*ArcSin[c*x])/(4*c^2*d^3*(1 - c^2*x^2)^2)
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^3}\,dx = \frac{a+b\sin^{-1}(cx)}{4c^2d^3(1-c^2x^2)^2} - \frac{b\int \frac{1}{(1-c^2x^2)^{5/2}}\,dx}{4cd^3}$$
$$= -\frac{bx}{12cd^3(1-c^2x^2)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{4c^2d^3(1-c^2x^2)^2} - \frac{b\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{6cd^3}$$
$$= -\frac{bx}{12cd^3(1-c^2x^2)^{3/2}} - \frac{bx}{6cd^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4c^2d^3(1-c^2x^2)^2}$$

Mathematica [**A**]
time = 0.07, size = 62, normalized size = 0.75

$$\frac{\frac{bcx(-3+2c^2x^2)}{3(1-c^2x^2)^{3/2}} + \frac{a+b\text{ArcSin}(cx)}{(-1+c^2x^2)^2}}{4c^2d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((b*c*x*(-3 + 2*c^2*x^2))/(3*(1 - c^2*x^2)^(3/2)) + (a + b*ArcSin[c*x])/(-1
 + c^2*x^2)^2)/(4*c^2*d^3)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 150 vs. 2(73) = 146.
time = 0.08, size = 151, normalized size = 1.82

method	result
derivativedivides	$\frac{\frac{a}{4d^3(c^2x^2-1)^2} - \frac{b\left(-\frac{\arcsin(cx)}{4(c^2x^2-1)^2} + \frac{\sqrt{-(cx-1)^2-2cx+2}}{48(cx-1)^2} - \frac{\sqrt{-(cx-1)^2-2cx+2}}{12(cx-1)} - \sqrt{-(cx}\right.}{d^3}}{c^2}$
default	$\frac{\frac{a}{4d^3(c^2x^2-1)^2} - \frac{b\left(-\frac{\arcsin(cx)}{4(c^2x^2-1)^2} + \frac{\sqrt{-(cx-1)^2-2cx+2}}{48(cx-1)^2} - \frac{\sqrt{-(cx-1)^2-2cx+2}}{12(cx-1)} - \sqrt{-(cx}\right.}{d^3}}{c^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/4*a/d^3/(c^2*x^2-1)^2-b/d^3*(-1/4/(c^2*x^2-1)^2*arcsin(c*x)+1/48/(
c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2)-1/12/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)
```

```
-1/12/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2
)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] 1/4*(4*(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)*integrate(1/4*e^(1/2*log(c*x
 + 1) + 1/2*log(-c*x + 1))/(c^9*d^3*x^8 - 3*c^7*d^3*x^6 + 3*c^5*d^3*x^4 - c
^3*d^3*x^2 + (c^7*d^3*x^6 - 3*c^5*d^3*x^4 + 3*c^3*d^3*x^2 - c*d^3)*e^(log(c
*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
*b/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) + 1/4*a/(c^6*d^3*x^4 - 2*c^4*d^3
*x^2 + c^2*d^3)
```

Fricas [A]
time = 1.75, size = 88, normalized size = 1.06

$$-\frac{3\,ac^4x^4-6\,ac^2x^2-3\,b\arcsin\left(cx\right)-\left(2\,bc^3x^3-3\,bcx\right)\sqrt{-c^2x^2+1}}{12\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
[Out] -1/12*(3*a*c^4*x^4 - 6*a*c^2*x^2 - 3*b*arcsin(c*x) - (2*b*c^3*x^3 - 3*b*c*x
)*sqrt(-c^2*x^2 + 1))/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int\frac{ax}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{bx\operatorname{asin}\left(cx\right)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a*x/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integral(b
*x*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 172 vs. 2(72) = 144.
time = 0.42, size = 172, normalized size = 2.07

$$\frac{bc^2x^4\arcsin\left(cx\right)}{4\left(c^2x^2-1\right)^2d^3}+\frac{ac^2x^4}{4\left(c^2x^2-1\right)^2d^3}+\frac{bcx^3}{12\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}\,d^3}-\frac{bx^2\arcsin\left(cx\right)}{2\left(c^2x^2-1\right)d^3}-\frac{ax^2}{2\left(c^2x^2-1\right)d^3}-\frac{bx}{4\sqrt{-c^2x^2+1}\,cd^3}+\frac{b\arcsin\left(cx\right)}{4\,c^2d^3}+\frac{a}{4\,c^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b*c^2*x^4*arcsin(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a*c^2*x^4/((c^2*x^2 -
 1)^2*d^3) + 1/12*b*c*x^3/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*d^3) - 1/2*b*x^
2*arcsin(c*x)/((c^2*x^2 - 1)*d^3) - 1/2*a*x^2/((c^2*x^2 - 1)*d^3) - 1/4*b*x
/(sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b*arcsin(c*x)/(c^2*d^3) + 1/4*a/(c^2*d^3)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{{(d-c^2\,d\,x^2)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.50 $\int \frac{a+b\textbf{ArcSin}(cx)}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=196

$$-\frac{b}{12cd^3(1-c^2x^2)^{3/2}}-\frac{3b}{8cd^3\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))}{4d^3(1-c^2x^2)^2}+\frac{3x(a+b\text{ArcSin}(cx))}{8d^3(1-c^2x^2)}-\frac{3i(a+b\text{ArcSin}(cx))A}{4cd}$$

```
[Out] -1/12*b/c/d^3/(-c^2*x^2+1)^(3/2)+1/4*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2
+3/8*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x))*arctan(I*
c*x+(-c^2*x^2+1)^(1/2))/c/d^3+3/8*I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))/c/d^3-3/8*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^3-3/8*b/c/d^3
/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4747, 4749, 4266, 2317, 2438, 267}

$$-\frac{3i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4cd^3}+\frac{3x(a+b\text{ArcSin}(cx))}{8d^3(1-c^2x^2)}+\frac{x(a+b\text{ArcSin}(cx))}{4d^3(1-c^2x^2)^2}+\frac{3ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{8cd^3}-\frac{3ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{8cd^3}-\frac{3b}{8cd^3\sqrt{1-c^2x^2}}-\frac{b}{12cd^3(1-c^2x^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*b/(c*d^3*(1 - c^2*x^2)^(3/2)) - (3*b)/(8*c*d^3*Sqrt[1 - c^2*x^2]) + (
x*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x]))/
(8*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) -
 (((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^3}\,dx = \frac{x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{x}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4d^3} + \frac{3\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^2}\,dx}{4d}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x(a+b\sin^{-1}(cx))}{8d^3\left(1-c^2x^2\right)} - \frac{(3bc)\int \frac{x}{\left(1-c^2x^2\right)^{3/}}}{8d^3}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x(a+b\sin^{-1}(cx))}{8d^3\left(1-c^2x^2\right)}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x(a+b\sin^{-1}(cx))}{8d^3\left(1-c^2x^2\right)}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x(a+b\sin^{-1}(cx))}{8d^3\left(1-c^2x^2\right)}$$

$$= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x(a+b\sin^{-1}(cx))}{8d^3\left(1-c^2x^2\right)}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 501 vs. 2(196) = 392.
time = 0.80, size = 501, normalized size = 2.56

$$-\frac{\frac{2b\sqrt{1-c^2x^2}}{3c(-1+cx)^2}-\frac{bx\sqrt{1-c^2x^2}}{3(-1+cx)^2}+\frac{2b\sqrt{1-c^2x^2}}{3c(1+cx)^2}+\frac{bx\sqrt{1-c^2x^2}}{3(1+cx)^2}+\frac{3b\sqrt{1-c^2x^2}}{c-c^2x}+\frac{3b\sqrt{1-c^2x^2}}{c+c^2x}-\frac{4ax}{(-1+c^2x^2)^2}+\frac{6ax}{-1+c^2x^2}+\frac{3ib\pi\operatorname{ArcSin}(cx)}{c}-\frac{b\operatorname{ArcSin}(cx)}{c(-1+cx)^2}+\frac{b\operatorname{ArcSin}(cx)}{c(1+cx)^2}-\frac{3b\operatorname{ArcSin}(cx)}{c-c^2x}+\frac{3b\operatorname{ArcSin}(cx)}{c+c^2x}-\frac{3b\pi\log\left(1-ie^{i\operatorname{ArcSin}(cx)}\right)}{c}-\frac{6b\operatorname{ArcSin}(cx)\log\left(1-ie^{i\operatorname{ArcSin}(cx)}\right)}{c}-\frac{3b\pi\log\left(1+ie^{i\operatorname{ArcSin}(cx)}\right)}{c}+\frac{6b\operatorname{ArcSin}(cx)\log\left(1+ie^{i\operatorname{ArcSin}(cx)}\right)}{c}+\frac{3a\log(1-cx)}{c}-\frac{3a\log(1+cx)}{c}+\frac{3b\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\operatorname{ArcSin}(cx))\right)\right)}{c}+\frac{3b\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\operatorname{ArcSin}(cx))\right)\right)}{c}-\frac{6ib\operatorname{PolyLog}\left(2,-ie^{i\operatorname{ArcSin}(cx)}\right)}{c}+\frac{6ib\operatorname{PolyLog}\left(2,ie^{i\operatorname{ArcSin}(cx)}\right)}{c}}{16d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/16*((2*b*Sqrt[1 - c^2*x^2])/(3*c*(-1 + c*x)^2) - (b*x*Sqrt[1 - c^2*x^2])
/(3*(-1 + c*x)^2) + (2*b*Sqrt[1 - c^2*x^2])/(3*c*(1 + c*x)^2) + (b*x*Sqrt[1
 - c^2*x^2])/(3*(1 + c*x)^2) + (3*b*Sqrt[1 - c^2*x^2])/(c - c^2*x) + (3*b*S
qrt[1 - c^2*x^2])/(c + c^2*x) - (4*a*x)/(-1 + c^2*x^2)^2 + (6*a*x)/(-1 + c^
2*x^2) + ((3*I)*b*Pi*ArcSin[c*x])/c - (b*ArcSin[c*x])/(c*(-1 + c*x)^2) + (b
*ArcSin[c*x])/(c*(1 + c*x)^2) - (3*b*ArcSin[c*x])/(c - c^2*x) + (3*b*ArcSin
[c*x])/(c + c^2*x) - (3*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c - (6*b*ArcSin[
c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])]
)/c + (6*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c + (3*a*Log[1 - c*x])
/c - (3*a*Log[1 + c*x])/c + (3*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c +
(3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((6*I)*b*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/c + ((6*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/c)/d^3
```

Maple [A]
time = 0.15, size = 358, normalized size = 1.83

method	result
derivativedivides	$-\frac{a}{16d^3(cx+1)^2}-\frac{3a}{16d^3(cx+1)}+\frac{3a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{3a}{16d^3(cx-1)}-\frac{3a\ln(cx-1)}{16d^3}-\frac{3b\arcsin(cx)c^3x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}+\frac{3b\,c^2x^2\sqrt{-c^2}}{8d^3\left(c^4x^4-2c\right.}$
default	$-\frac{a}{16d^3(cx+1)^2}-\frac{3a}{16d^3(cx+1)}+\frac{3a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{3a}{16d^3(cx-1)}-\frac{3a\ln(cx-1)}{16d^3}-\frac{3b\arcsin(cx)c^3x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}+\frac{3b\,c^2x^2\sqrt{-c^2}}{8d^3\left(c^4x^4-2c\right.}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-1/16*a/d^3/(c*x+1)^2-3/16*a/d^3/(c*x+1)+3/16*a/d^3*ln(c*x+1)+1/16*a/d
^3/(c*x-1)^2-3/16*a/d^3/(c*x-1)-3/16*a/d^3*ln(c*x-1)-3/8*b/d^3/(c^4*x^4-2*c
^2*x^2+1)*arcsin(c*x)*c^3*x^3+3/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2*(-c^2
*x^2+1)^(1/2)+5/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c*x-11/24*b/d^3/(
c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-3/8*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x
+(-c^2*x^2+1)^(1/2)))+3/8*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+3/8*I*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*I*b/d^3*dilog(1-I
*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a*(2*(3*c^2*x^3 - 5*x)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) - 3*log(c*
x + 1)/(c*d^3) + 3*log(c*x - 1)/(c*d^3)) + 1/16*(3*(c^4*x^4 - 2*c^2*x^2 + 1
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^4*x^4 - 2*
c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(
3*c^3*x^3 - 5*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^5*d^3
*x^4 - 2*c^3*d^3*x^2 + c*d^3)*integrate(-1/16*(6*c^3*x^3 - 10*c*x - 3*(c^4*
x^4 - 2*c^2*x^2 + 1)*log(c*x + 1) + 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log(-c*x +
1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x
^2 - d^3), x))*b/(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2
- d^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^3, x)
```

3.51 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=173

$$-\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bcx}{3d^3\sqrt{1-c^2x^2}}+\frac{a+b\text{ArcSin}(cx)}{4d^3\left(1-c^2x^2\right)^2}+\frac{a+b\text{ArcSin}(cx)}{2d^3\left(1-c^2x^2\right)}-\frac{2(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{2iA}\right.}{d^3}$$

```
[Out] -1/12*b*c*x/d^3/(-c^2*x^2+1)^(3/2)+1/4*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2
+1/2*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)-2*(a+b*arcsin(c*x))*arctanh((I*c*x+
(-c^2*x^2+1)^(1/2))^2)/d^3+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
/d^3-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-2/3*b*c*x/d^3/(-c^
2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.18, antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4793, 4769, 4504, 4268, 2317, 2438, 197, 198}

$$\frac{a+b\text{ArcSin}(cx)}{2d^3\left(1-c^2x^2\right)}+\frac{a+b\text{ArcSin}(cx)}{4d^3\left(1-c^2x^2\right)^2}-\frac{2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}+\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d^3}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^3}-\frac{2bcx}{3d^3\sqrt{1-c^2x^2}}-\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/12*(b*c*x)/(d^3*(1 - c^2*x^2)^(3/2)) - (2*b*c*x)/(3*d^3*Sqrt[1 - c^2*x^2
]) + (a + b*ArcSin[c*x])/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])/(2*d
^3*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/
d^3 + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((I/2)*b*PolyLog[2
, E^((2*I)*ArcSin[c*x])])/d^3
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^3}\,dx = \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int\frac{1}{(1-c^2x^2)^{5/2}}\,dx}{4d^3} + \frac{\int\frac{a+b\sin^{-1}(cx)}{x(d-c^2dx^2)^2}\,dx}{d}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{(bc)\int\frac{1}{(1-c^2x^2)^{3/2}}\,dx}{6d^3} - \frac{(b$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} + \frac{\text{Subst}(}{}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} + \frac{2\text{Subst}}{}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{2(a+}{}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{2(a+}{}$$

$$= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\sin^{-1}(cx)}{4d^3\left(1-c^2x^2\right)^2} + \frac{a+b\sin^{-1}(cx)}{2d^3\left(1-c^2x^2\right)} - \frac{2(a+}{}$$

Mathematica [A]
time = 0.65, size = 201, normalized size = 1.16

$$-\frac{-\frac{3a}{(-1+c^2x^2)^2}+\frac{6a}{-1+c^2x^2}-12a\log(x)+6a\log\left(1-c^2x^2\right)+b\left(\frac{cx}{(1-c^2x^2)^{3/2}}+\frac{8cx}{\sqrt{1-c^2x^2}}-\frac{3\text{ArcSin}(cx)}{(-1+c^2x^2)^2}+\frac{6\text{ArcSin}(cx)}{-1+c^2x^2}-12\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+12\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-6i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)+6i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)}{12d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/12*((-3*a)/(-1 + c^2*x^2)^2 + (6*a)/(-1 + c^2*x^2) - 12*a*Log[x] + 6*a*L
og[1 - c^2*x^2] + b*((c*x)/(1 - c^2*x^2)^(3/2) + (8*c*x)/Sqrt[1 - c^2*x^2]
- (3*ArcSin[c*x])/(-1 + c^2*x^2)^2 + (6*ArcSin[c*x])/(-1 + c^2*x^2) - 12*Ar
cSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 12*ArcSin[c*x]*Log[1 + E^((2*I)*
ArcSin[c*x])] - (6*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + (6*I)*PolyLog[2,
 E^((2*I)*ArcSin[c*x])]))/d^3
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 502 vs. 2(185) = 370.
time = 0.24, size = 503, normalized size = 2.91

method	result

derivativedivides	$\frac{a}{16d^3(cx+1)^2}+\frac{5a}{16d^3(cx+1)}-\frac{a\ln(cx+1)}{2d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{5a}{16d^3(cx-1)}-\frac{a\ln(cx-1)}{2d^3}+\frac{a\ln(cx)}{d^3}+\frac{ib\,\mathrm{poly}}{}$
default	$\frac{a}{16d^3(cx+1)^2}+\frac{5a}{16d^3(cx+1)}-\frac{a\ln(cx+1)}{2d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{5a}{16d^3(cx-1)}-\frac{a\ln(cx-1)}{2d^3}+\frac{a\ln(cx)}{d^3}+\frac{ib\,\mathrm{poly}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16*a/d^3/(c*x+1)^2+5/16*a/d^3/(c*x+1)-1/2*a/d^3*ln(c*x+1)+1/16*a/d^3/(c*x
-1)^2-5/16*a/d^3/(c*x-1)-1/2*a/d^3*ln(c*x-1)+a/d^3*ln(c*x)-I*b/d^3*polylog(
2,-I*c*x-(-c^2*x^2+1)^(1/2))+2/3*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3*(-c^2*
x^2+1)^(1/2)-1/2*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^2*x^2-2/3*I*b/d^
3/(c^4*x^4-2*c^2*x^2+1)-3/4*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c*x*(-c^2*x^2+1)^(1
/2)+3/4*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)-I*b/d^3*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))+b/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/2*I*b*p
olylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-b/d^3*arcsin(c*x)*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))^2)-2/3*I*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^4*x^4+b/d^3*arcsi
n(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+4/3*I*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2
*x^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((2*c^2*x^2 - 3)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) + 2*log(c*x + 1
)/d^3 + 2*log(c*x - 1)/d^3 - 4*log(x)/d^3) - b*integrate(arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3
*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3
- d^3*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**3,x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^3), x)
```

3.52 $\int \frac{a+b\text{ArcSin}(cx)}{x^2(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=242

$$-\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\text{ArcSin}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\text{ArcSin}(cx))}{4d^3\left(1-c^2x^2\right)^2}+\frac{15c^2x(a+b\text{ArcSin}(cx))}{8d^3\left(1-c^2x^2\right)}$$

```
[Out] -1/12*b*c/d^3/(-c^2*x^2+1)^(3/2)+(-a-b*arcsin(c*x))/d^3/x/(-c^2*x^2+1)^2+5/
4*c^2*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+15/8*c^2*x*(a+b*arcsin(c*x))/d
^3/(-c^2*x^2+1)-15/4*I*c*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))
/d^3-b*c*arctanh((-c^2*x^2+1)^(1/2))/d^3+15/8*I*b*c*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/d^3-15/8*I*b*c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^
3-7/8*b*c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.440$, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214}

$$-\frac{15ic\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4d^3}+\frac{15c^2x(a+b\text{ArcSin}(cx))}{8d^3\left(1-c^2x^2\right)}+\frac{5c^2x(a+b\text{ArcSin}(cx))}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\text{ArcSin}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{15ibc\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{8d^3}-\frac{15ibc\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{8d^3}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/12*(b*c)/(d^3*(1 - c^2*x^2)^(3/2)) - (7*b*c)/(8*d^3*Sqrt[1 - c^2*x^2]) -
 (a + b*ArcSin[c*x])/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x])
)/(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*
x^2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^3 -
(b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^3 + (((15*I)/8)*b*c*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/d^3 - (((15*I)/8)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
```

```
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx = -\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\left(5c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}}\,dx}{d^3}$$

$$= -\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}+\frac{(bc)\text{Subst}\left(\int \frac{1}{x\left(1-c^2x\right)^{5/2}}\,dx,x,x^2\right)}{2d^3}-$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}+\frac{15c^2x(a+b\sin^{-1}}{8d^3\left(1-c^2x\right.}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 512 vs. $2(242) = 484$.
time = 0.90, size = 512, normalized size = 2.12

$$-\frac{\frac{16a}{x}+\frac{2bc\sqrt{1-c^2x^2}}{3(-1+cx)^2}-\frac{bc^2x\sqrt{1-c^2x^2}}{3(-1+cx)^2}-\frac{7bc\sqrt{1-c^2x^2}}{-1+cx}+\frac{2bc\sqrt{1-c^2x^2}}{3(1+cx)^2}+\frac{bc^2x\sqrt{1-c^2x^2}}{3(1+cx)^2}+\frac{7bc\sqrt{1-c^2x^2}}{1+cx}-\frac{4ac^2x}{(-1+c^2x^2)^2}+\frac{14ac^2x}{-1+c^2x^2}+15ibc\pi \text{ArcSin}(cx)+\frac{16b\text{ArcSin}(cx)}{x}-\frac{bc\text{ArcSin}(cx)}{(-1+cx)^2}+\frac{7bc\text{ArcSin}(cx)}{-1+cx}+\frac{bc\text{ArcSin}(cx)}{(1+cx)^2}+\frac{7bc\text{ArcSin}(cx)}{1+cx}+16bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-15bc\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-30bc\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-15bc\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+30bc\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+15ac\log(1-cx)-15ac\log(1+cx)+15bc\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+15bc\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-30ibc\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+30ibc\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{16d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/16*((16*a)/x + (2*b*c*Sqrt[1 - c^2*x^2])/(3*(-1 + c*x)^2) - (b*c^2*x*Sqr
t[1 - c^2*x^2])/(3*(-1 + c*x)^2) - (7*b*c*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (
2*b*c*Sqrt[1 - c^2*x^2])/(3*(1 + c*x)^2) + (b*c^2*x*Sqrt[1 - c^2*x^2])/(3*(
1 + c*x)^2) + (7*b*c*Sqrt[1 - c^2*x^2])/(1 + c*x) - (4*a*c^2*x)/(-1 + c^2*x
^2)^2 + (14*a*c^2*x)/(-1 + c^2*x^2) + (15*I)*b*c*Pi*ArcSin[c*x] + (16*b*Arc
Sin[c*x])/x - (b*c*ArcSin[c*x])/(-1 + c*x)^2 + (7*b*c*ArcSin[c*x])/(-1 + c*
x) + (b*c*ArcSin[c*x])/(1 + c*x)^2 + (7*b*c*ArcSin[c*x])/(1 + c*x) + 16*b*c
*ArcTanh[Sqrt[1 - c^2*x^2]] - 15*b*c*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 30*b
*c*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 15*b*c*Pi*Log[1 + I*E^(I*ArcS
in[c*x])] + 30*b*c*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 15*a*c*Log[1
- c*x] - 15*a*c*Log[1 + c*x] + 15*b*c*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
+ 15*b*c*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (30*I)*b*c*PolyLog[2, (-I)*E
^(I*ArcSin[c*x])] + (30*I)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Maple [A]
time = 0.25, size = 454, normalized size = 1.88

method	result
derivativedivides	$c\Bigg(-\frac{a}{16d^3(cx+1)^2}-\frac{7a}{16d^3(cx+1)}+\frac{15a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{7a}{16d^3(cx-1)}-\frac{15a\ln(cx-1)}{16d^3}-\frac{a}{d^3cx}-$
default	$c\Bigg(-\frac{a}{16d^3(cx+1)^2}-\frac{7a}{16d^3(cx+1)}+\frac{15a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{7a}{16d^3(cx-1)}-\frac{15a\ln(cx-1)}{16d^3}-\frac{a}{d^3cx}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-1/16*a/d^3/(c*x+1)^2-7/16*a/d^3/(c*x+1)+15/16*a/d^3*ln(c*x+1)+1/16*a/d^
3/(c*x-1)^2-7/16*a/d^3/(c*x-1)-15/16*a/d^3*ln(c*x-1)-a/d^3/c/x-15/8*b/d^3/(
c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^3*x^3+7/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^
2*x^2*(-c^2*x^2+1)^(1/2)+25/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c*x-2
3/24*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-b/d^3/(c^4*x^4-2*c^2*x^
2+1)/c/x*arcsin(c*x)+b/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-b/d^3*ln(1+I*c*x+
(-c^2*x^2+1)^(1/2))+15/8*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))-15/8*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-15/8*I*b/d^3*d
```

```
ilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/8*I*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^
2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] -1/16*a*(2*(15*c^4*x^4 - 25*c^2*x^2 + 8)/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3
*x) - 15*c*log(c*x + 1)/d^3 + 15*c*log(c*x - 1)/d^3) + 1/16*(15*(c^5*x^5 -
2*c^3*x^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) -
15*(c^5*x^5 - 2*c^3*x^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*l
og(-c*x + 1) - 2*(15*c^4*x^4 - 25*c^2*x^2 + 8)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)) + 16*(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*x)*integrate(-1/16*(
30*c^5*x^4 - 50*c^3*x^2 - 15*(c^6*x^5 - 2*c^4*x^3 + c^2*x)*log(c*x + 1) + 1
5*(c^6*x^5 - 2*c^4*x^3 + c^2*x)*log(-c*x + 1) + 16*c)*sqrt(c*x + 1)*sqrt(-c
*x + 1)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x))*b/(c^4*d
^3*x^5 - 2*c^2*d^3*x^3 + d^3*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c^2*d^3*x^4
- d^3*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^{6}x^{8}-3c^{4}x^{6}+3c^{2}x^{4}-x^{2}}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^{6}x^{8}-3c^{4}x^{6}+3c^{2}x^{4}-x^{2}}\,dx}{d^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x) + Integral(
b*asin(c*x)/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x))/d**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^3), x)
```

3.53 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=248

$$-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\text{ArcSin}(cx))}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\text{ArcSin}(cx)}{2d^3x^2\left(1-c^2x^2\right)^2}+\frac{3c^2(\cdots}{2\cdots}$$

```
[Out] -1/2*b*c/d^3/x/(-c^2*x^2+1)^(3/2)+5/12*b*c^3*x/d^3/(-c^2*x^2+1)^(3/2)+3/4*c
^2*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+1/2*(-a-b*arcsin(c*x))/d^3/x^2/(-c^
2*x^2+1)^2+3/2*c^2*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)-6*c^2*(a+b*arcsin(c*x
))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+3/2*I*b*c^2*polylog(2,-(I*c*x+
(-c^2*x^2+1)^(1/2))^2)/d^3-3/2*I*b*c^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
^2)/d^3-2/3*b*c^3*x/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.25, antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4789, 4793, 4769, 4504, 4268, 2317, 2438, 197, 198, 277}

$$\frac{3c^2(a+b\text{ArcSin}(cx))}{2d^3\left(1-c^2x^2\right)}+\frac{3c^2(a+b\text{ArcSin}(cx))}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\text{ArcSin}(cx)}{2d^3x^2\left(1-c^2x^2\right)^2}-\frac{6c^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}+\frac{3ibc^2\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d^3}-\frac{3ibc^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^3}-\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/2*(b*c)/(d^3*x*(1 - c^2*x^2)^(3/2)) + (5*b*c^3*x)/(12*d^3*(1 - c^2*x^2)^
(3/2)) - (2*b*c^3*x)/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a + b*ArcSin[c*x])
)/(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])/(2*d^3*x^2*(1 - c^2*x^2)^2)
 + (3*c^2*(a + b*ArcSin[c*x]))/(2*d^3*(1 - c^2*x^2)) - (6*c^2*(a + b*ArcSin
[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (((3*I)/2)*b*c^2*PolyLog[2, -E
^((2*I)*ArcSin[c*x])])/d^3 - (((3*I)/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*
x])])/d^3
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^3}\,dx = -\frac{a+b\sin^{-1}(cx)}{2d^3x^2\left(1-c^2x^2\right)^2}+\left(3c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int \frac{1}{x^2(1-c^2x^2)^{5/2}}\,dx}{2d^3}$$

$$= -\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{3c^2(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(cx)}{2d^3x^2\left(1-c^2x^2\right)^2}-\frac{\left(3bc^3\right)\int \frac{1}{(1-c^2x^2)}}{4d^3}$$

$$= -\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}+\frac{3c^2(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}-\frac{a+b\sin^{-1}(cx}{2d^3x^2\left(1-c^2x\right.}$$

$$= -\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{bc}{2d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\sin^{-1}(cx))}{4d^3\left(1-c^2x^2\right)^2}$$

Mathematica [A]
time = 1.06, size = 256, normalized size = 1.03

$$-\frac{\frac{6a}{x^2}-\frac{3ac^2}{\left(-1+c^2x^2\right)^2}+\frac{12ac^2}{-1+c^2x^2}-36ac^2\log(x)+18ac^2\log\left(1-c^2x^2\right)+bc^2\left(\frac{cx}{(1-c^2x^2)^{3/2}}+\frac{14cx}{\sqrt{1-c^2x^2}}+\frac{6\sqrt{1-c^2x^2}}{cx}+\frac{6\text{ArcSin}(cx)}{c^2x^2}-\frac{3\text{ArcSin}(cx)}{\left(-1+c^2x^2\right)^2}+\frac{12\text{ArcSin}(cx)}{-1+c^2x^2}-36\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+36\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-18i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)+18i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)}{12d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/12*((6*a)/x^2 - (3*a*c^2)/(-1 + c^2*x^2)^2 + (12*a*c^2)/(-1 + c^2*x^2) -
 36*a*c^2*Log[x] + 18*a*c^2*Log[1 - c^2*x^2] + b*c^2*((c*x)/(1 - c^2*x^2)^(
3/2) + (14*c*x)/Sqrt[1 - c^2*x^2] + (6*Sqrt[1 - c^2*x^2])/(c*x) + (6*ArcSin
[c*x])/(c^2*x^2) - (3*ArcSin[c*x])/(-1 + c^2*x^2)^2 + (12*ArcSin[c*x])/(-1
+ c^2*x^2) - 36*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 36*ArcSin[c*x]
*Log[1 + E^((2*I)*ArcSin[c*x])] - (18*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])]
 + (18*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/d^3
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 599 vs. $2(257) = 514$.
time = 0.29, size = 600, normalized size = 2.42

method	result
derivativedivides	$c^2\left(\frac{a}{16d^3(cx+1)^2}+\frac{9a}{16d^3(cx+1)}-\frac{3a\ln(cx+1)}{2d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{9a}{16d^3(cx-1)}-\frac{3a\ln(cx-1)}{2d^3}-\frac{a}{2d^3c^2x^2}+\right.$
default	$c^2\left(\frac{a}{16d^3(cx+1)^2}+\frac{9a}{16d^3(cx+1)}-\frac{3a\ln(cx+1)}{2d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{9a}{16d^3(cx-1)}-\frac{3a\ln(cx-1)}{2d^3}-\frac{a}{2d^3c^2x^2}+\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(1/16*a/d^3/(c*x+1)^2+9/16*a/d^3/(c*x+1)-3/2*a/d^3*ln(c*x+1)+1/16*a/d^3
/(c*x-1)^2-9/16*a/d^3/(c*x-1)-3/2*a/d^3*ln(c*x-1)-1/2*a/d^3/c^2/x^2+3*a/d^3
*ln(c*x)+3/2*I*b/d^3*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2/3*b/d^3/(c^
4*x^4-2*c^2*x^2+1)*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/2*b/d^3/(c^4*x^4-2*c^2*x^2+
1)*arcsin(c*x)*c^2*x^2-3*I*b/d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/4*b/
d^3/(c^4*x^4-2*c^2*x^2+1)*c*x*(-c^2*x^2+1)^(1/2)+9/4*b/d^3/(c^4*x^4-2*c^2*x
^2+1)*arcsin(c*x)+4/3*I*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2-1/2*b/d^3/(c^4*
x^4-2*c^2*x^2+1)/c/x*(-c^2*x^2+1)^(1/2)-1/2*b/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2
/x^2*arcsin(c*x)+3*b/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*I*b/d
^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-3*b/d^3*arcsin(c*x)*ln(1+(I*c*x+(-c
^2*x^2+1)^(1/2))^2)-2/3*I*b/d^3/(c^4*x^4-2*c^2*x^2+1)+3*b/d^3*arcsin(c*x)*l
n(1-I*c*x-(-c^2*x^2+1)^(1/2))-2/3*I*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^4*x^4)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*c^4*x^4 - 9*c^2*x^2 + 2)/(c^4*d^3*x^6 - 2*c^2*d^3*x^4 + d^3*x^2)
 + 6*c^2*log(c*x + 1)/d^3 + 6*c^2*log(c*x - 1)/d^3 - 12*c^2*log(x)/d^3) - b
*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^9 - 3*c^4*
d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5
- d^3*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x) + Integral(
b*asin(c*x)/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x))/d**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^3), x)
```

3.54 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x^4(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=317

$$\frac{bc^3}{12d^3(1-c^2x^2)^{3/2}}-\frac{bc}{6d^3x^2(1-c^2x^2)^{3/2}}-\frac{29bc^3}{24d^3\sqrt{1-c^2x^2}}-\frac{a+b\text{ArcSin}(cx)}{3d^3x^3(1-c^2x^2)^2}-\frac{7c^2(a+b\text{ArcSin}(cx))}{3d^3x(1-c^2x^2)^2}+\frac{35c^4x}{12}$$

```
[Out] 1/12*b*c^3/d^3/(-c^2*x^2+1)^(3/2)-1/6*b*c/d^3/x^2/(-c^2*x^2+1)^(3/2)+1/3*(-
a-b*arcsin(c*x))/d^3/x^3/(-c^2*x^2+1)^2-7/3*c^2*(a+b*arcsin(c*x))/d^3/x/(-c
^2*x^2+1)^2+35/12*c^4*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+35/8*c^4*x*(a+
b*arcsin(c*x))/d^3/(-c^2*x^2+1)-35/4*I*c^3*(a+b*arcsin(c*x))*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))/d^3-19/6*b*c^3*arctanh((-c^2*x^2+1)^(1/2))/d^3+35/8*I*b*
c^3*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-35/8*I*b*c^3*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-29/24*b*c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.27, antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.480$, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214, 44}

$$-\frac{35ic^3\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4d^3}-\frac{7c^2(a+b\text{ArcSin}(cx))}{3d^3x(1-c^2x^2)^2}-\frac{a+b\text{ArcSin}(cx)}{3d^3x^3(1-c^2x^2)^2}+\frac{35c^4x(a+b\text{ArcSin}(cx))}{8d^3(1-c^2x^2)}+\frac{35c^4x(a+b\text{ArcSin}(cx))}{12d^3(1-c^2x^2)^2}+\frac{35ibc^3\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{8d^3}-\frac{35ibc^3\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{8d^3}-\frac{bc}{6d^3x^2(1-c^2x^2)^{3/2}}-\frac{29bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{bc^3}{12d^3(1-c^2x^2)^{3/2}}-\frac{19bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] (b*c^3)/(12*d^3*(1 - c^2*x^2)^(3/2)) - (b*c)/(6*d^3*x^2*(1 - c^2*x^2)^(3/2)
) - (29*b*c^3)/(24*d^3*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(3*d^3*x^3*
(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x]))/(3*d^3*x*(1 - c^2*x^2)^2) +
(35*c^4*x*(a + b*ArcSin[c*x]))/(12*d^3*(1 - c^2*x^2)^2) + (35*c^4*x*(a + b*
ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b*ArcSin[c*x])*A
rcTan[E^(I*ArcSin[c*x])])/d^3 - (19*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d^
3) + (((35*I)/8)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - (((35*I)/8
)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
```

```
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx = -\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(7c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int \frac{1}{x^3(1-c^2x^2)^{5/2}}\,dx}{3d^3}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2(a+b\sin^{-1}(cx))}{3d^3x\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(35c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)}{}$$

$$= \frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2(a+b\sin^{-1}(cx))}{3d^3x\left(1-c^2x^2\right)^2}+\frac{35c^4x(a+b\sin^{-}}{12d^3\left(1-c^2x\right.}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}-\frac{a+b\sin^{-1}(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}$$

$$= -\frac{7bc^3}{36d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc}{9d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{49bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{5bc}{9d^3x^2\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.88, size = 587, normalized size = 1.85

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/48*((16*a)/x^3 + (144*a*c^2)/x + (8*b*c*Sqrt[1 - c^2*x^2])/x^2 + (2*b*c^
3*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 - (b*c^4*x*Sqrt[1 - c^2*x^2])/(-1 + c*x)^
2 - (33*b*c^3*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (2*b*c^3*Sqrt[1 - c^2*x^2])/(
1 + c*x)^2 + (b*c^4*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (33*b*c^3*Sqrt[1 - c
^2*x^2])/(1 + c*x) - (12*a*c^4*x)/(-1 + c^2*x^2)^2 + (66*a*c^4*x)/(-1 + c^2
*x^2) + (105*I)*b*c^3*Pi*ArcSin[c*x] + (16*b*ArcSin[c*x])/x^3 + (144*b*c^2*
ArcSin[c*x])/x - (3*b*c^3*ArcSin[c*x])/(-1 + c*x)^2 + (33*b*c^3*ArcSin[c*x]
)/(-1 + c*x) + (3*b*c^3*ArcSin[c*x])/(1 + c*x)^2 + (33*b*c^3*ArcSin[c*x])/(
```

```
1 + c*x) + 152*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 105*b*c^3*Pi*Log[1 - I*E^
(I*ArcSin[c*x])] - 210*b*c^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 105
*b*c^3*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 210*b*c^3*ArcSin[c*x]*Log[1 + I*E^
(I*ArcSin[c*x])] + 105*a*c^3*Log[1 - c*x] - 105*a*c^3*Log[1 + c*x] + 105*b*
c^3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 105*b*c^3*Pi*Log[Sin[(Pi + 2*Arc
Sin[c*x])/4]] - (210*I)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (210*I)*
b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Maple [A]
time = 0.30, size = 547, normalized size = 1.73

method	result
derivativedivides	$c^3\left(-\frac{a}{16d^3(cx+1)^2}-\frac{11a}{16d^3(cx+1)}+\frac{35a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{11a}{16d^3(cx-1)}-\frac{35a\ln(cx-1)}{16d^3}-\frac{a}{3d^3c^3x^3}\right.$
default	$c^3\left(-\frac{a}{16d^3(cx+1)^2}-\frac{11a}{16d^3(cx+1)}+\frac{35a\ln(cx+1)}{16d^3}+\frac{a}{16d^3(cx-1)^2}-\frac{11a}{16d^3(cx-1)}-\frac{35a\ln(cx-1)}{16d^3}-\frac{a}{3d^3c^3x^3}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-1/16*a/d^3/(c*x+1)^2-11/16*a/d^3/(c*x+1)+35/16*a/d^3*ln(c*x+1)+1/16*a
/d^3/(c*x-1)^2-11/16*a/d^3/(c*x-1)-35/16*a/d^3*ln(c*x-1)-1/3*a/d^3/c^3/x^3-
3*a/d^3/c/x-35/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^3*x^3+29/24*b/d^
3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2*(-c^2*x^2+1)^(1/2)+175/24*b/d^3/(c^4*x^4-2*
c^2*x^2+1)*arcsin(c*x)*c*x-9/8*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/
2)-7/3*b/d^3/(c^4*x^4-2*c^2*x^2+1)/c/x*arcsin(c*x)-1/6*b/d^3/(c^4*x^4-2*c^2
*x^2+1)/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/3*b/d^3/(c^4*x^4-2*c^2*x^2+1)/c^3/x^3*
arcsin(c*x)+19/6*b/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-19/6*b/d^3*ln(1+I*c*x
+(-c^2*x^2+1)^(1/2))+35/8*I*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-35/
8*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/8*b/d^3*arcsin(c*
x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-35/8*I*b/d^3*dilog(1-I*(I*c*x+(-c^2*x
^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/48*a*(105*c^3*log(c*x + 1)/d^3 - 105*c^3*log(c*x - 1)/d^3 - 2*(105*c^6*x^
6 - 175*c^4*x^4 + 56*c^2*x^2 + 8)/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*x^3))
```

```
+ 1/48*(105*(c^7*x^7 - 2*c^5*x^5 + c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(c*x + 1) - 105*(c^7*x^7 - 2*c^5*x^5 + c^3*x^3)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(105*c^6*x^6 - 175*c^4*x^4
 + 56*c^2*x^2 + 8)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 48*(c^4*d^3
*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)*integrate(-1/48*(210*c^7*x^6 - 350*c^5*x^4
+ 112*c^3*x^2 - 105*(c^8*x^7 - 2*c^6*x^5 + c^4*x^3)*log(c*x + 1) + 105*(c^8
*x^7 - 2*c^6*x^5 + c^4*x^3)*log(-c*x + 1) + 16*c)*sqrt(c*x + 1)*sqrt(-c*x +
 1)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x))*b/(c^4*d^3
*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^10 - 3*c^4*d^3*x^8 + 3*c^2*d^3*x^6
 - d^3*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x) + Integral
(b*asin(c*x)/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x))/d**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^4), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\operatorname{asin}(c\,x)}{x^4\,{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^3), x)
```

3.55 $\int x^4 \sqrt{d-c^2 d x^2} (a+b\mathbf{ArcSin}(cx)) \, dx$

Optimal. Leaf size=262

$$\frac{b x^2 \sqrt{d-c^2 d x^2}}{32 c^3 \sqrt{1-c^2 x^2}}+\frac{b x^4 \sqrt{d-c^2 d x^2}}{96 c \sqrt{1-c^2 x^2}}-\frac{b c x^6 \sqrt{d-c^2 d x^2}}{36 \sqrt{1-c^2 x^2}}-\frac{x \sqrt{d-c^2 d x^2} (a+b\text{ArcSin}(cx))}{16 c^4}-\frac{x^3 \sqrt{d-c^2 d x^2} (a}{24}$$

```
[Out] -1/16*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4-1/24*x^3*(a+b*arcsin(c*x
))*(-c^2*d*x^2+d)^(1/2)/c^2+1/6*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))+
1/32*b*x^2*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/96*b*x^4*(-c^2*d*x
^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/36*b*c*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^
2+1)^(1/2)+1/32*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^5/(-c^2*x^2+1)
^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 262, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4783, 4795, 4737, 30}

$$\frac{1}{6} x^5 \sqrt{d-c^2 d x^2} (a+b\text{ArcSin}(cx))-\frac{x^3 \sqrt{d-c^2 d x^2} (a+b\text{ArcSin}(cx))}{24 c^2}+\frac{\sqrt{d-c^2 d x^2} (a+b\text{ArcSin}(cx))^2}{32 b c^5 \sqrt{1-c^2 x^2}}-\frac{x \sqrt{d-c^2 d x^2} (a+b\text{ArcSin}(cx))}{16 c^4}-\frac{b c x^6 \sqrt{d-c^2 d x^2}}{36 \sqrt{1-c^2 x^2}}+\frac{b x^4 \sqrt{d-c^2 d x^2}}{96 c \sqrt{1-c^2 x^2}}+\frac{b x^2 \sqrt{d-c^2 d x^2}}{32 c^3 \sqrt{1-c^2 x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(32*c^3*Sqrt[1 - c^2*x^2]) + (b*x^4*Sqrt[d - c^
2*d*x^2])/(96*c*Sqrt[1 - c^2*x^2]) - (b*c*x^6*Sqrt[d - c^2*d*x^2])/(36*Sqrt
[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*c^4) - (x^
3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(24*c^2) + (x^5*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/6 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3
2*b*c^5*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{6}x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\int\frac{x^4(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,d}{6\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{24c^2}+\frac{1}{6}x^5\sqrt{d-}$$

$$=\frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}}-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.}{16c^4}$$

$$=\frac{bx^2\sqrt{d-c^2dx^2}}{32c^3\sqrt{1-c^2x^2}}+\frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}}-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-}}{}$$

Mathematica [A]
time = 0.08, size = 169, normalized size = 0.65

$$\frac{\sqrt{d-c^2dx^2}\left(9a^2+b^2c^2x^2(9+3c^2x^2-8c^4x^4)+6abcx\sqrt{1-c^2x^2}(-3-2c^2x^2+8c^4x^4)+6b\left(3a+bcx\sqrt{1-c^2x^2}(-3-2c^2x^2+8c^4x^4)\right)\text{ArcSin}(cx)+9b^2\text{ArcSin}(cx)^2\right)}{288bc^5\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(9*a^2 + b^2*c^2*x^2*(9 + 3*c^2*x^2 - 8*c^4*x^4) + 6*a
*b*c*x*Sqrt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 8*c^4*x^4) + 6*b*(3*a + b*c*x*Sq
```

```
rt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + 9*b^2*ArcSin[c*
x]^2))/(288*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.52, size = 673, normalized size = 2.57

method	result
default	$-\frac{a x^3(-c^2 d x^2+d)^{\frac{3}{2}}}{6c^2 d}-\frac{a x(-c^2 d x^2+d)^{\frac{3}{2}}}{8c^4 d}+\frac{a x\sqrt{-c^2 d x^2+d}}{16c^4}+\frac{a d \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d x^2+d}}\right)}{16c^4\sqrt{c^2 d}}+b\Bigg(-\frac{\sqrt{-d(}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*a*x^3*(-c^2*d*x^2+d)^(3/2)/c^2/d-1/8*a/c^4*x*(-c^2*d*x^2+d)^(3/2)/d+1/
16*a/c^4*x*(-c^2*d*x^2+d)^(1/2)+1/16*a/c^4*d/(c^2*d)^(1/2)*arctan((c^2*d)^(
1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^2+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c
^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x
^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(
I+6*arcsin(c*x))/c^5/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^
2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))
/c^5/(c^2*x^2-1)+1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^
(1/2)-I)*(7*I+48*arcsin(c*x))*cos(5*arcsin(c*x))/c^5/(c^2*x^2-1)-1/4608*(-d
*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+24*arcsin(c*
x))*sin(5*arcsin(c*x))/c^5/(c^2*x^2-1)-3/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^
2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*cos(3*arcsin(c*x))/c^5/(c^2*x^2-1)-1/512*(-d*
(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(I+8*arcsin(c*x))*s
in(3*arcsin(c*x))/c^5/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^4*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x) - 1/48*(8*(-c^2*d*x^2 + d)^(3/2)*x^3/(c^2*d) - 3*s
qrt(-c^2*d*x^2 + d)*x/c^4 + 6*(-c^2*d*x^2 + d)^(3/2)*x/(c^4*d) - 3*sqrt(d)*
arcsin(c*x)/c^5)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^4 \sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\operatorname{asin}(cx))\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^4, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,(a+b\operatorname{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.56 $\int x^2 \sqrt{d-c^2dx^2} (a+b\text{ArcSin}(cx)) \, dx$

Optimal. Leaf size=189

$$\frac{bx^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8c^2}+\frac{1}{4}x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+$$

```
[Out] -1/8*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*x^3*(-c^2*d*x^2+d)^(1
/2)*(a+b*arcsin(c*x))+1/16*b*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-
1/16*b*c*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*(a+b*arcsin(c*x))
^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4783, 4795, 4737, 30}

$$-\frac{x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8c^2}+\frac{1}{4}x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{16bc^3\sqrt{1-c^2x^2}}+\frac{bx^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(16*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d - c^
2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 + (Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
```

```
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\int\frac{x^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,d}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c^2}+\frac{1}{4}x^3\sqrt{d-c}$$

$$= \frac{bx^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.}{8c^2}$$

Mathematica [A]
time = 0.07, size = 140, normalized size = 0.74

$$\frac{\sqrt{d-c^2dx^2}\left(a^2+b^2c^2x^2(1-c^2x^2)+2abcx\sqrt{1-c^2x^2}\,(-1+2c^2x^2)+2b\left(a+bcx\sqrt{1-c^2x^2}\,(-1+2c^2x^2)\right)\text{ArcSin}(cx)+b^2\text{ArcSin}(cx)^2\right)}{16bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a^2 + b^2*c^2*x^2*(1 - c^2*x^2) + 2*a*b*c*x*Sqrt[1 -
c^2*x^2]*(-1 + 2*c^2*x^2) + 2*b*(a + b*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^
2))*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.24, size = 367, normalized size = 1.94

method	result

default	$-\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{ax\sqrt{-c^2d\,x^2+d}}{8c^2}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{8c^2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x}}{16c^3(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/8*a/c^2*x*(-c^2*d*x^2+d)^(1/2)+1/8*a/
c^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/16*(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2+1/25
6*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(
c*x))/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*
x^4*c^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^
(1/2)+4*c*x)*(-I+4*arcsin(c*x))/c^3/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^2*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x) + 1/8*a*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^
2 + d)^(3/2)*x/(c^2*d) + sqrt(d)*arcsin(c*x)/c^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^2\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.57 $\int \sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=116

$$-\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-1/4*b*c*x^2*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)+1/4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^
2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {4741, 4737, 30}

$$\frac{1}{2}x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(b*c*x^2*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x^2] + (x*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*
b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-$$
$$=-\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{\sqrt{d-c^2dx^2}}{4bc}$$

Mathematica [A]
time = 0.04, size = 111, normalized size = 0.96

$$\frac{\sqrt{d-c^2dx^2}\left(a^2-b^2c^2x^2+2abcx\sqrt{1-c^2x^2}+2b\left(a+bcx\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)+b^2\text{ArcSin}(cx)^2\right)}{4bc\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a^2 - b^2*c^2*x^2 + 2*a*b*c*x*Sqrt[1 - c^2*x^2] + 2*b
*(a + b*c*x*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(4*b*c*Sqr
t[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.10, size = 280, normalized size = 2.41

method	result
default	$\frac{ax\sqrt{-c^2d\,x^2+d}}{2}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{4c\left(c^2x^2-1\right)}+\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a*x*(-c^2*d*x^2+d)^(1/2)+1/2*a*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(
-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c
^2*x^2-1)*arcsin(c*x)^2+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))/c/(c^2*x^
2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-
I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))/c/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)), x) + 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)
*a
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.58 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\textbf{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=110

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x}-\frac{c\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2b\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\,\log(x)}{\sqrt{1-c^2x^2}}$$

```
[Out] -(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x-1/2*c*(a+b*arcsin(c*x))^2*(-c^2*d
*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+b*c*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4781, 29, 4737}

$$-\frac{c\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2b\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x) - (c*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[
x])/Sqrt[1 - c^2*x^2]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
```

```
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x^2}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{1}{x}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(c^2\sqrt{\right.}{}}{}$$

$$= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x} - \frac{c\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2b\sqrt{1-c^2x^2}} +$$

Mathematica [A]
time = 0.23, size = 142, normalized size = 1.29

$$-\frac{a\sqrt{-d(-1+c^2x^2)}}{x}+ac\sqrt{d}\,\text{ArcTan}\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}\,(-1+c^2x^2)}\right)-\frac{bc\sqrt{d(1-c^2x^2)}\left(\frac{2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{cx}+\text{ArcSin}(cx)^2-2\log(cx)\right)}{2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*Sqrt[-(d*(-1 + c^2*x^2))])/x) + a*c*Sqrt[d]*ArcTan[(c*x*Sqrt[-(d*(-1 +
 c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))] - (b*c*Sqrt[d*(1 - c^2*x^2)]*((2*Sqr
t[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]^2 - 2*Log[c*x]))/(2*Sqrt[1
- c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.20, size = 308, normalized size = 2.80

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{3}{2}}}{dx} - a\,c^2x\sqrt{-c^2d\,x^2+d} - \frac{a\,c^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}} + \frac{b\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x^2}}{2c^2x^2-2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(3/2)-a*c^2*x*(-c^2*d*x^2+d)^(1/2)-a*c^2*d/(c^2*d)^(1
/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/2*b*(-d*(c^2*x^2-1))^(1/
2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c+I*b*(-c^2*x^2+1)^(1/2)*(-
d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c-b*(-d*(c^2*x^2-1))^(1/2)*arc
sin(c*x)/(c^2*x^2-1)*x*c^2+b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)
/x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*
x^2+1)^(1/2))^2-1)*c
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x^2, x) - (c*sqrt(d)*arcsin(c*x) + sqrt(-c^2*d*x^2 + d)/x)
*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^2,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^2, x)
```

3.59 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=111

$$-\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3dx^3}-\frac{bc^3\sqrt{d-c^2dx^2}\,\log(x)}{3\sqrt{1-c^2x^2}}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/d/x^3-1/6*b*c*(-c^2*d*x^2+d)^(1
/2)/x^2/(-c^2*x^2+1)^(1/2)-1/3*b*c^3*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.074$, Rules used = {4771, 14}

$$-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3dx^3}-\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{bc^3\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*Sqrt[d - c^2*d*x^2])/(x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(
3/2)*(a + b*ArcSin[c*x]))/(3*d*x^3) - (b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3
*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x^4}\,dx = -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{3dx^3} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{1-c^2x^2}{x^3}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{3dx^3} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \left(\frac{1}{x^3}-\frac{c^2}{x}\right) c$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{3dx^3} - \frac{bc^3\sqrt{d-c^2dx}}{3\sqrt{1-c}}$$

Mathematica [**A**]
time = 0.11, size = 134, normalized size = 1.21

$$\frac{\sqrt{d-c^2dx^2}\left(bcx(1-3c^2x^2)\sqrt{1-c^2x^2}+2a(-1+c^2x^2)^2+2b(-1+c^2x^2)^2\,\mathrm{ArcSin}(cx)\right)}{6x^3\,(-1+c^2x^2)} - \frac{bc^3\sqrt{d-c^2dx^2}\,\log(x)}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(b*c*x*(1 - 3*c^2*x^2)*Sqrt[1 - c^2*x^2] + 2*a*(-1 + c
^2*x^2)^2 + 2*b*(-1 + c^2*x^2)^2*ArcSin[c*x]))/(6*x^3*(-1 + c^2*x^2)) - (b*
c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```

Maple [**C**] Result contains complex when optimal does not.
time = 0.29, size = 1117, normalized size = 10.06

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{3}{2}}}{3dx^3}+\frac{ib\sqrt{-d(c^2x^2-1)}\,x^3c^6}{3(3c^4x^4-3c^2x^2+1)(c^2x^2-1)}-\frac{2ib\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)c^3}{3c^2x^2-3}+\frac{b\sqrt{-d(}}{(3c^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(3/2)+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4
-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))
^(1/2)*arcsin(c*x)*c^3/(3*c^2*x^2-3)+b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*
c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^
4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5-1/6*I
*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+1/3*I
*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)*c^3-3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^
3/(c^2*x^2-1)*arcsin(c*x)*c^6+1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c
```

```
^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*
c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*
x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+I*b*(-d*(c^2*x^2-1)
)^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*c^7+10/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)
*arcsin(c*x)*c^4-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3
/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-1/2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2
*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-5/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*
c^4*x^4-3*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^2+1/6*b*(-d*(c^2*x^2-1))^(
1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/3*b*(-d
*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+1/3
*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^
2+1)^(1/2))^2-1)*c^3
```

Maxima [A]
time = 0.49, size = 137, normalized size = 1.23

$$\frac{\left((-1)^{-2\,c^2dx^2+2\,d}c^2d^{\frac{3}{2}}\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+c^2d^{\frac{3}{2}}\log\left(x^2-\frac{1}{c^2}\right)-\frac{\sqrt{c^4dx^4-2\,c^2dx^2+d}\,d}{x^2}\right)bc}{6\,d}-\frac{(-c^2dx^2+d)^{\frac{3}{2}}b\arcsin\left(cx\right)}{3\,dx^3}-\frac{(-c^2dx^2+d)^{\frac{3}{2}}a}{3\,dx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/6*((-1)^(-2*c^2*d*x^2 + 2*d)*c^2*d^(3/2)*log(-2*c^2*d + 2*d/x^2) + c^2*d^
(3/2)*log(x^2 - 1/c^2) - sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*d/x^2)*b*c/d - 1
/3*(-c^2*d*x^2 + d)^(3/2)*b*arcsin(c*x)/(d*x^3) - 1/3*(-c^2*d*x^2 + d)^(3/2
)*a/(d*x^3)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 199 vs. 2(95) = 190.
time = 2.35, size = 414, normalized size = 3.73

$$\left[\frac{(bc^5x^5-bc^3x^3)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-\sqrt{-c^2dx^2+d}\,(bcx^3-bcx)\sqrt{-c^2x^2+1}+2\left(ac^4x^4-2\,ac^2x^2+(bc^4x^4-2\,bc^2x^2+b)\arcsin\left(cx\right)+a\right)\sqrt{-c^2dx^2+d}}{6\,(c^2x^5-x^3)},-\frac{2\,(bc^5x^5-bc^3x^3)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)+\sqrt{-c^2dx^2+d}\,(bcx^3-bcx)\sqrt{-c^2x^2+1}-2\left(ac^4x^4-2\,ac^2x^2+(bc^4x^4-2\,bc^2x^2+b)\arcsin\left(cx\right)+a\right)\sqrt{-c^2dx^2+d}}{6\,(c^2x^5-x^3)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] [1/6*((b*c^5*x^5 - b*c^3*x^3)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4 +
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 - x
^2)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*x^2 + 1) + 2*(a*c^4
*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsin(c*x) + a)*sqrt(-c
^2*d*x^2 + d))/(c^2*x^5 - x^3), -1/6*(2*(b*c^5*x^5 - b*c^3*x^3)*sqrt(-d)*ar
ctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4
- (c^2 + 1)*d*x^2 + d)) + sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*
x^2 + 1) - 2*(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsi
n(c*x) + a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^5 - x^3)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**4, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)\,\sqrt{d-c^2\,d\,x^2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^4, x)
```

3.60 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x^6}\,dx$

Optimal. Leaf size=187

$$-\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{5dx^5}-\frac{2c^2(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx)}{15dx^3}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/d/x^5-2/15*c^2*(-c^2*d*x^2+d)^(
3/2)*(a+b*arcsin(c*x))/d/x^3-1/20*b*c*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)
^(1/2)+1/30*b*c^3*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-2/15*b*c^5*ln
(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {277, 270, 4779, 12, 14}

$$-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{5dx^5}-\frac{2c^2(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{15dx^3}-\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}-\frac{2bc^5\log(x)\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -1/20*(b*c*Sqrt[d - c^2*d*x^2])/(x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c
^2*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/(5*d*x^5) - (2*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(15*
d*x^3) - (2*b*c^5*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x^6}\,dx = -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-3+c^2x^2+2c^4x^4}{15x^5}\,dx}{\sqrt{1-c^2x^2}} + (a+b\sin^{-1}(cx))\int \frac{\sqrt{d-c}}{x^6}$$

$$= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{5dx^5} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-3+c^2x^2+2c^4x}{x^5}}{15\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{5dx^5} - \frac{2c^2(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(c}{15dx^3}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(}{5dx^5}$$

Mathematica [A]
time = 0.10, size = 162, normalized size = 0.87

$$\frac{\sqrt{d-c^2dx^2}\left(12a(-1+c^2x^2)^2(3+2c^2x^2)+bcx\sqrt{1-c^2x^2}\,(9-6c^2x^2-50c^4x^4)+12b(-1+c^2x^2)^2(3+2c^2x^2)\,\mathrm{ArcSin}(cx)\right)}{180x^5(-1+c^2x^2)} - \frac{2bc^5\sqrt{d-c^2dx^2}\,\log(x)}{15\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(12*a*(-1 + c^2*x^2)^2*(3 + 2*c^2*x^2) + b*c*x*Sqrt[1
- c^2*x^2]*(9 - 6*c^2*x^2 - 50*c^4*x^4) + 12*b*(-1 + c^2*x^2)^2*(3 + 2*c^2*
x^2)*ArcSin[c*x]))/(180*x^5*(-1 + c^2*x^2)) - (2*b*c^5*Sqrt[d - c^2*d*x^2]*
Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.34, size = 1903, normalized size = 10.18

method	result	size
default	Expression too large to display	1903

Verification of antiderivative is not currently implemented for this CAS.

[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x,method=_RETURNVERBOSE)

[Out] a*(-1/5/d/x^5*(-c^2*d*x^2+d)^(3/2)-2/15*c^2/d/x^3*(-c^2*d*x^2+d)^(3/2))+1/4
b(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/(c^2*x^2-1)*(
-c^2*x^2+1)^(1/2)*c^5+9/5*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15
*c^2*x^2+9)/x^5/(c^2*x^2-1)*arcsin(c*x)+2/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(15
*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-2/15*I*b
(-d(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^5/(c^2*x^2-1)
*(-c^2*x^2+1)*c^10-3/10*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15
*c^2*x^2+9)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^8+3/10*I*b*(-d*(c^2*x^2-1))^(1/2
)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+6/5*I*
b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/(c^2*x^2-1)*ar
csin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+2*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5
*c^4*x^4-15*c^2*x^2+9)*x^6/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^11-
2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^4/(c^2
*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9-2*I*b*(-d*(c^2*x^2-1))^(1/2)/(15
*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)*c^7+2/15*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I
*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^5+12/5*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6
-5*c^4*x^4-15*c^2*x^2+9)/x/(c^2*x^2-1)*arcsin(c*x)*c^4-21/20*b*(-d*(c^2*x^2
-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)
^(1/2)*c^3-27/5*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9
)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^2+9/20*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6
-5*c^4*x^4-15*c^2*x^2+9)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+2*b*(-d*(c^2*
x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^7/(c^2*x^2-1)*arcsin(c*
x)*c^12-5/3*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^
5/(c^2*x^2-1)*arcsin(c*x)*c^10-1/2*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c
^4*x^4-15*c^2*x^2+9)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9-17/3*b*(-d*(c^2
*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)*arcsin(c
*x)*c^8+11/12*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*
x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7+98/15*b*(-d*(c^2*x^2-1))^(1/2)/(15*c
^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*arcsin(c*x)*c^6-3/10*I*b*(-d*(
c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*c^6-4*I
b(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5/(15*c^2*x^2-15
)+2/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^9/(
c^2*x^2-1)*c^14-4/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^
2*x^2+9)*x^7/(c^2*x^2-1)*c^12-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*
c^4*x^4-15*c^2*x^2+9)*x^5/(c^2*x^2-1)*c^10+3/5*I*b*(-d*(c^2*x^2-1))^(1/2)/(
15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)*c^8

Maxima [A]
time = 0.48, size = 140, normalized size = 0.75

$$-\frac{1}{60}\left(8\,c^4\sqrt{d}\,\log\left(x\right)-\frac{2\,c^2\sqrt{d}\,x^2-3\,\sqrt{d}}{x^4}\right)bc-\frac{1}{15}\,b\left(\frac{2\,{\left(-c^2dx^2+d\right)}^{\frac{3}{2}}c^2}{dx^3}+\frac{3\,{\left(-c^2dx^2+d\right)}^{\frac{3}{2}}}{dx^5}\right)\arcsin\left(cx\right)-\frac{1}{15}\,a\left(\frac{2\,{\left(-c^2dx^2+d\right)}^{\frac{3}{2}}c^2}{dx^3}+\frac{3\,{\left(-c^2dx^2+d\right)}^{\frac{3}{2}}}{dx^5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/60*(8*c^4*sqrt(d)*log(x) - (2*c^2*sqrt(d)*x^2 - 3*sqrt(d))/x^4)*b*c - 1/
15*b*(2*(-c^2*d*x^2 + d)^(3/2)*c^2/(d*x^3) + 3*(-c^2*d*x^2 + d)^(3/2)/(d*x^
5))*arcsin(c*x) - 1/15*a*(2*(-c^2*d*x^2 + d)^(3/2)*c^2/(d*x^3) + 3*(-c^2*d*
x^2 + d)^(3/2)/(d*x^5))
```

Fricas [A]
time = 2.54, size = 501, normalized size = 2.68

$$\left[\frac{4\,{\left(bc^7x^7-bc^5x^5\right)}\sqrt{d}\,\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,{\left(x^4-1\right)}\sqrt{d}-d}{c^2x^4-x^2}\right)-{\left(2\,bc^3x^3-{\left(2\,bc^3-3\,bc\right)}x^5-3\,bcx\right)}\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+4\,{\left(2\,ac^6x^6-ac^4x^4-4\,ac^2x^2+{\left(2\,bc^6x^6-bc^4x^4-4\,bc^2x^2+3\,b\right)}\arcsin\left(cx\right)+3\,a\right)}\sqrt{-c^2dx^2+d}}{60\,{\left(c^2x^7-x^5\right)}},-\frac{8\,{\left(bc^7x^7-bc^5x^5\right)}\sqrt{-d}\,\arctan\left(\frac{\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,{\left(x^2+1\right)}\sqrt{-d}}{c^2dx^4-{\left(c^2+1\right)}dx^2+d}\right)+{\left(2\,bc^3x^3-{\left(2\,bc^3-3\,bc\right)}x^5-3\,bcx\right)}\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}-4\,{\left(2\,ac^6x^6-ac^4x^4-4\,ac^2x^2+{\left(2\,bc^6x^6-bc^4x^4-4\,bc^2x^2+3\,b\right)}\arcsin\left(cx\right)+3\,a\right)}\sqrt{-c^2dx^2+d}}{60\,{\left(c^2x^7-x^5\right)}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [1/60*(4*(b*c^7*x^7 - b*c^5*x^5)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4
 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4
- x^2)) - (2*b*c^3*x^3 - (2*b*c^3 - 3*b*c)*x^5 - 3*b*c*x)*sqrt(-c^2*d*x^2 +
 d)*sqrt(-c^2*x^2 + 1) + 4*(2*a*c^6*x^6 - a*c^4*x^4 - 4*a*c^2*x^2 + (2*b*c^
6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2 + 3*b)*arcsin(c*x) + 3*a)*sqrt(-c^2*d*x^2 +
 d))/(c^2*x^7 - x^5), -1/60*(8*(b*c^7*x^7 - b*c^5*x^5)*sqrt(-d)*arctan(sqrt
(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 +
1)*d*x^2 + d)) + (2*b*c^3*x^3 - (2*b*c^3 - 3*b*c)*x^5 - 3*b*c*x)*sqrt(-c^2*
d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(2*a*c^6*x^6 - a*c^4*x^4 - 4*a*c^2*x^2 +
(2*b*c^6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2 + 3*b)*arcsin(c*x) + 3*a)*sqrt(-c^2*
d*x^2 + d))/(c^2*x^7 - x^5)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\,\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**6, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^6,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^6, x)
```

3.61 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))}{x^8}\,dx$

Optimal. Leaf size=263

$$-\frac{bc\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{140x^4\sqrt{1-c^2x^2}}+\frac{2bc^5\sqrt{d-c^2dx^2}}{105x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))}{7dx^7}-\frac{4c^2(d-c^2dx$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/d/x^7-4/35*c^2*(-c^2*d*x^2+d)^(
3/2)*(a+b*arcsin(c*x))/d/x^5-8/105*c^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x
))/d/x^3-1/42*b*c*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+1/140*b*c^3*(
-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)+2/105*b*c^5*(-c^2*d*x^2+d)^(1/2)
/x^2/(-c^2*x^2+1)^(1/2)-8/105*b*c^7*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {277, 270, 4779, 12, 14}

$$-\frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))}{7dx^7}-\frac{4c^2(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))}{35dx^5}-\frac{8c^4(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))}{105dx^3}-\frac{bc\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}-\frac{8bc^7\log(x)\sqrt{d-c^2dx^2}}{105\sqrt{1-c^2x^2}}+\frac{2bc^5\sqrt{d-c^2dx^2}}{105x^2\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{140x^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/42*(b*c*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c
^2*d*x^2])/(140*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^5*Sqrt[d - c^2*d*x^2])/(105
*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(7*d*
x^7) - (4*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) - (8*c^
4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*d*x^3) - (8*b*c^7*Sqrt[d
- c^2*d*x^2]*Log[x])/(105*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
```

```
p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x^8}\,dx = -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-15+3c^2x^2+4c^4x^4+8c^6x^6}{105x^7}\,dx}{\sqrt{1-c^2x^2}} + (a+b\sin^{-1}(cx))\int \ldots$$

$$= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{7dx^7} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-15+3c^2x^2+4c^4x^4 \ldots}{x^7} \ldots}{105\sqrt{1-c^2x^2}} \ldots$$

$$= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{7dx^7} - \frac{4c^2(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx)) \ldots}{35dx^5} \ldots$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{140x^4\sqrt{1-c^2x^2}} + \frac{2bc^5\sqrt{d-c^2dx^2}}{105x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2 \ldots}{\ldots}$$

Mathematica [A]
time = 0.11, size = 187, normalized size = 0.71

$$\frac{\sqrt{d-c^2dx^2}\left(20a(-1+c^2x^2)^2(15+12c^2x^2+8c^4x^4)-bcx\sqrt{1-c^2x^2}(-50+15c^2x^2+40c^4x^4+392c^6x^6)+20b(-1+c^2x^2)^2(15+12c^2x^2+8c^4x^4)\,\mathrm{ArcSin}(cx)\right)}{2100x^7(-1+c^2x^2)} - \frac{8bc^7\sqrt{d-c^2dx^2}\,\log(x)}{105\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(20*a*(-1 + c^2*x^2)^2*(15 + 12*c^2*x^2 + 8*c^4*x^4) -
 b*c*x*Sqrt[1 - c^2*x^2]*(-50 + 15*c^2*x^2 + 40*c^4*x^4 + 392*c^6*x^6) + 20
```

```
*b*(-1 + c^2*x^2)^2*(15 + 12*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]))/(2100*x^7*(
-1 + c^2*x^2)) - (8*b*c^7*Sqrt[d - c^2*d*x^2]*Log[x])/(105*Sqrt[1 - c^2*x^2
])
```

Maple [C] Result contains complex when optimal does not.
time = 0.39, size = 2751, normalized size = 10.46

method	result	size
default	Expression too large to display	2751

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x,method=_RETURNVERBOSE)
```

```
[Out] 30/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2
*x^2+225)*x^3/(c^2*x^2-1)*c^10+152/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*
x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1)*c^12-20/7*I*b*(
-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*
x/(c^2*x^2-1)*c^8-16*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c
*x)*c^7/(105*c^2*x^2-105)+128/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-1
05*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^13/(c^2*x^2-1)*c^20-16/105*I*b*(-d
*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^
11/(c^2*x^2-1)*c^18-40/21*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x
^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/(c^2*x^2-1)*c^16-214/105*I*b*(-d*(c^2*x^
2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^7/(c^2*x
^2-1)*c^14+469/60*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*
x^4-315*c^2*x^2+225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9+3057/35*b*(-d*(
c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x/(c
^2*x^2-1)*arcsin(c*x)*c^8-16/3*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^
6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13-4
/15*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^
2+225)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^12-351/5*b*(-d*(c^2*x^2-1))^(1/2)/(280
*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^3/(c^2*x^2-1)*arcsin(c*x
)*c^10-594/35*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-
315*c^2*x^2+225)/x/(c^2*x^2-1)*arcsin(c*x)*c^6+64/3*b*(-d*(c^2*x^2-1))^(1/2
)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/(c^2*x^2-1)*arcs
in(c*x)*c^16-56/3*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*
x^4-315*c^2*x^2+225)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^14-71/28*b*(-d*(c^2*x^2-
1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^2/(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)*c^5+342/7*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*
c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^4-255/28*
b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+22
5)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-585/7*b*(-d*(c^2*x^2-1))^(1/2)/(2
80*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^5/(c^2*x^2-1)*arcsin(c
*x)*c^2+75/14*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-
315*c^2*x^2+225)/x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+64/3*I*b*(-d*(c^2*x^2
```

```
-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^8/(c^2*x^
2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^15-8*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*
c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^6/(c^2*x^2-1)*(-c^2*x^2+1
)^(1/2)*arcsin(c*x)*c^13-8/5*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^
6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin
(c*x)*c^11-24*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^
4-315*c^2*x^2+225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^9-88/10
5*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^
2+225)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^14-302/105*I*b*(-d*(c^2*x^2-1))^(1/2)
/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1)*(-c^2
*x^2+1)*c^12-10/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^
4*x^4-315*c^2*x^2+225)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^10+20/7*I*b*(-d*(c^2*
x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x/(c^2*x
^2-1)*(-c^2*x^2+1)*c^8+120/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^
6*x^6-21*c^4*x^4-315*c^2*x^2+225)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x
)*c^7+128/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^
4-315*c^2*x^2+225)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^18+16/15*I*b*(-d*(c^2*x^
2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/(c^2*x
^2-1)*(-c^2*x^2+1)*c^16+8/105*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^7+225/7*b*(-d*(c^2*x^2-1))^
(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^7/(c^2*x^2-1)*
arcsin(c*x)+73/20*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*
x^4-315*c^2*x^2+225)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7+a*(-1/7/d/x^7*(-c^2
*d*x^2+d)^(3/2)+4/7*c^2*(-1/5/d/x^5*(-c^2*d*x^2+d)^(3/2)-2/15*c^2/d/x^3*(-c
^2*d*x^2+d)^(3/2)))
```

Maxima [A]
time = 0.49, size = 199, normalized size = 0.76

$$-\frac{1}{420}\left(32\,c^6\sqrt{d}\,\log\left(x\right)-\frac{8\,c^4\sqrt{d}\,x^4+3\,c^2\sqrt{d}\,x^2-10\,\sqrt{d}}{x^6}\right)bc-\frac{1}{105}\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^4}{dx^3}+\frac{12\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^2}{dx^5}+\frac{15\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{dx^7}\right)b\arcsin\left(cx\right)-\frac{1}{105}\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^4}{dx^3}+\frac{12\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^2}{dx^5}+\frac{15\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{dx^7}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] -1/420*(32*c^6*sqrt(d)*log(x) - (8*c^4*sqrt(d)*x^4 + 3*c^2*sqrt(d)*x^2 - 10
*sqrt(d))/x^6)*b*c - 1/105*(8*(-c^2*d*x^2 + d)^(3/2)*c^4/(d*x^3) + 12*(-c^2
*d*x^2 + d)^(3/2)*c^2/(d*x^5) + 15*(-c^2*d*x^2 + d)^(3/2)/(d*x^7))*b*arcsin
(c*x) - 1/105*(8*(-c^2*d*x^2 + d)^(3/2)*c^4/(d*x^3) + 12*(-c^2*d*x^2 + d)^(
3/2)*c^2/(d*x^5) + 15*(-c^2*d*x^2 + d)^(3/2)/(d*x^7))*a
```

Fricas [A]
time = 2.86, size = 567, normalized size = 2.16

$$\left[\frac{16\left(bc^9x^9-bc^7x^7\right)\sqrt{d}\,\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right)-\left(8\,bc^5x^5-\left(8\,bc^5+3\,bc^3-10\,bc\right)x^7+3\,bc^3x^3-10\,bcx\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+4\left(8\,ac^8x^8-4\,ac^6x^6-ac^4x^4-18\,ac^2x^2+\left(8\,bc^8x^8-4\,bc^6x^6-bc^4x^4-18\,bc^2x^2+15\,b\right)\arcsin\left(cx\right)+15\,a\right)\sqrt{-c^2dx^2+d}}{420\left(c^2x^9-x^7\right)},\ -\frac{32\left(bc^9x^9-bc^7x^7\right)\sqrt{-d}\,\arctan\left(\frac{\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,\left(x^2+1\right)\sqrt{-d}}{c^2dx^4-\left(c^2+1\right)dx^2+d}\right)+\left(8\,bc^5x^5-\left(8\,bc^5+3\,bc^3-10\,bc\right)x^7+3\,bc^3x^3-10\,bcx\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}-4\left(8\,ac^8x^8-4\,ac^6x^6-ac^4x^4-18\,ac^2x^2+\left(8\,bc^8x^8-4\,bc^6x^6-bc^4x^4-18\,bc^2x^2+15\,b\right)\arcsin\left(cx\right)+15\,a\right)\sqrt{-c^2dx^2+d}}{420\left(c^2x^9-x^7\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/420*(16*(b*c^9*x^9 - b*c^7*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x
^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^
4 - x^2)) - (8*b*c^5*x^5 - (8*b*c^5 + 3*b*c^3 - 10*b*c)*x^7 + 3*b*c^3*x^3 -
 10*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 4*(8*a*c^8*x^8 - 4*a*c
^6*x^6 - a*c^4*x^4 - 18*a*c^2*x^2 + (8*b*c^8*x^8 - 4*b*c^6*x^6 - b*c^4*x^4
- 18*b*c^2*x^2 + 15*b)*arcsin(c*x) + 15*a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 -
 x^7), -1/420*(32*(b*c^9*x^9 - b*c^7*x^7)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 +
 d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)
) + (8*b*c^5*x^5 - (8*b*c^5 + 3*b*c^3 - 10*b*c)*x^7 + 3*b*c^3*x^3 - 10*b*c*
x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(8*a*c^8*x^8 - 4*a*c^6*x^6 -
 a*c^4*x^4 - 18*a*c^2*x^2 + (8*b*c^8*x^8 - 4*b*c^6*x^6 - b*c^4*x^4 - 18*b*c
^2*x^2 + 15*b)*arcsin(c*x) + 15*a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**8, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{d-c^2\,d\,x^2}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^8,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^8, x)
```

3.62 $\int x^5\sqrt{d-c^2dx^2}\,(a+b\,\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=256

$$\frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}}-\frac{bcx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx)}{3c^6d}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^6/d+2/5*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))/c^6/d^2-1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^6/d^
3+8/105*b*x*(-c^2*d*x^2+d)^(1/2)/c^5/(-c^2*x^2+1)^(1/2)+4/315*b*x^3*(-c^2*d
*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/175*b*x^5*(-c^2*d*x^2+d)^(1/2)/c/(-c
^2*x^2+1)^(1/2)-1/49*b*c*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}=0.148$, Rules used = {272, 45, 4779, 12}

$$-\frac{(d-c^2dx^2)^{7/2}\,(a+b\text{ArcSin}(cx))}{7c^6d^3}+\frac{2(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{5c^6d^2}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c^6d}-\frac{bcx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}}+\frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*x*Sqrt[d - c^2*d*x^2])/(105*c^5*Sqrt[1 - c^2*x^2]) + (4*b*x^3*Sqrt[d -
 c^2*d*x^2])/(315*c^3*Sqrt[1 - c^2*x^2]) + (b*x^5*Sqrt[d - c^2*d*x^2])/(175
*c*Sqrt[1 - c^2*x^2]) - (b*c*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c^2*x^2]
) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^6*d) + (2*(d - c^2*d*x
^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d^2) - ((d - c^2*d*x^2)^(7/2)*(a + b*
ArcSin[c*x]))/(7*c^6*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-8-4c^2x^2-3c^4x^4+15c^6x^6}{105c^6}\,dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx)\right)$$
$$=-\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(-8-4c^2x^2-3c^4x^4+15c^6x^6\right)\,dx}{105c^5\sqrt{1-c^2x^2}}+\frac{1}{2}(a+$$
$$=\frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}}-\frac{bcx^7\sqrt{}}{49\sqrt{}}$$
$$=\frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}}-\frac{bcx^7\sqrt{}}{49\sqrt{}}$$

Mathematica [A]
time = 0.11, size = 157, normalized size = 0.61

$$\frac{\sqrt{d-c^2dx^2}\left(bcx(840+140c^2x^2+63c^4x^4-225c^6x^6)+105a\sqrt{1-c^2x^2}\,(-8-4c^2x^2-3c^4x^4+15c^6x^6)+105b\sqrt{1-c^2x^2}\,(-8-4c^2x^2-3c^4x^4+15c^6x^6)\,\mathrm{ArcSin}(cx)\right)}{11025c^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(b*c*x*(840 + 140*c^2*x^2 + 63*c^4*x^4 - 225*c^6*x^6)
+ 105*a*Sqrt[1 - c^2*x^2]*(-8 - 4*c^2*x^2 - 3*c^4*x^4 + 15*c^6*x^6) + 105*b
*Sqrt[1 - c^2*x^2]*(-8 - 4*c^2*x^2 - 3*c^4*x^4 + 15*c^6*x^6)*ArcSin[c*x]))/
(11025*c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.35, size = 880, normalized size = 3.44

method	result

default	$a\left(-\frac{x^{4}\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}{7c^{2}d}+\frac{-\frac{4x^{2}\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}{35c^{2}d}-\frac{8\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}{105d\,c^{4}}}{c^{2}}\right)+b\left(\frac{\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\left(64c^{8}x^{8}-144c^{6}x^{6}-64i\sqrt{-c^{2}}\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/7*x^4*(-c^2*d*x^2+d)^(3/2)/c^2/d+4/7/c^2*(-1/5*x^2*(-c^2*d*x^2+d)^(3/
2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2)))+b*(1/6272*(-d*(c^2*x^2-1))^(1/2)
*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(
-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))/c^6/(c^2*x^2-1)+3/3200*(-d*(c^2*
x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2
*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arc
sin(c*x))/c^6/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2
+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^6/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/
2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/(c^2*x^2-1)+1/1
152*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-
c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^6/(c^2*x^2-1)+1/6272
*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(
-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c
^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))/c^6/(c^2
*x^2-1)+1/7200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*
(-13*I+15*arcsin(c*x))*cos(4*arcsin(c*x))/c^6/(c^2*x^2-1)-1/14400*(-d*(c^2*
x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(-I+105*arcsin(c*x))*sin
(4*arcsin(c*x))/c^6/(c^2*x^2-1))
```

Maxima [A]
time = 0.50, size = 197, normalized size = 0.77

$$-\frac{1}{105}\left(\frac{15\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}x^{4}}{c^{2}d}+\frac{12\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}x^{2}}{c^{4}d}+\frac{8\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}}{c^{6}d}\right)b\arcsin\left(cx\right)-\frac{1}{105}\left(\frac{15\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}x^{4}}{c^{2}d}+\frac{12\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}x^{2}}{c^{4}d}+\frac{8\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}}{c^{6}d}\right)a-\frac{\left(225\,c^{6}\sqrt{d}\,x^{7}-63\,c^{4}\sqrt{d}\,x^{5}-140\,c^{2}\sqrt{d}\,x^{3}-840\,\sqrt{d}\,x\right)b}{11025\,c^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/105*(15*(-c^2*d*x^2 + d)^(3/2)*x^4/(c^2*d) + 12*(-c^2*d*x^2 + d)^(3/2)*x
^2/(c^4*d) + 8*(-c^2*d*x^2 + d)^(3/2)/(c^6*d))*b*arcsin(c*x) - 1/105*(15*(-
c^2*d*x^2 + d)^(3/2)*x^4/(c^2*d) + 12*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^4*d) +
8*(-c^2*d*x^2 + d)^(3/2)/(c^6*d))*a - 1/11025*(225*c^6*sqrt(d)*x^7 - 63*c^4
*sqrt(d)*x^5 - 140*c^2*sqrt(d)*x^3 - 840*sqrt(d)*x)*b/c^5
```

Fricas [A]
time = 2.08, size = 177, normalized size = 0.69

$$\frac{\left(225\,bc^{7}x^{7}-63\,bc^{5}x^{5}-140\,bc^{3}x^{3}-840\,bcx\right)\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}+105\left(15\,ac^{8}x^{8}-18\,ac^{6}x^{6}-ac^{4}x^{4}-4\,ac^{2}x^{2}+\left(15\,bc^{8}x^{8}-18\,bc^{6}x^{6}-bc^{4}x^{4}-4\,bc^{2}x^{2}+8\,b\right)\arcsin\left(cx\right)+8\,a\right)\sqrt{-c^{2}dx^{2}+d}}{11025\left(c^{8}x^{2}-c^{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*((225*b*c^7*x^7 - 63*b*c^5*x^5 - 140*b*c^3*x^3 - 840*b*c*x)*sqrt(-c
^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 105*(15*a*c^8*x^8 - 18*a*c^6*x^6 - a*c^4
*x^4 - 4*a*c^2*x^2 + (15*b*c^8*x^8 - 18*b*c^6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2
 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c^6)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^5 \sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**5*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^5\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.63 $\int x^3\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=183

$$\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c^4d}+\frac{(d-c^2dx^2)^{5/2}\,(a}{5c^4d}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^4/d+1/5*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))/c^4/d^2+2/15*b*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1
/2)+1/45*b*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/25*b*c*x^5*(-c^2
*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {272, 45, 4779, 12}

$$\frac{(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{5c^4d^2}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c^4d}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*x*Sqrt[d - c^2*d*x^2])/(15*c^3*Sqrt[1 - c^2*x^2]) + (b*x^3*Sqrt[d - c^
2*d*x^2])/(45*c*Sqrt[1 - c^2*x^2]) - (b*c*x^5*Sqrt[d - c^2*d*x^2])/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^4*d) + ((
d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-2-c^2x^2+3c^4x^4}{15c^4}\,dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx)\right)\int x^3\sqrt{}$$

$$=-\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+3c^4x^4\right)\,dx}{15c^3\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+b\sin^{-1}(cx)\right.$$

$$=\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{1}{2}(a+$$

$$=\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{(d-c}{}$$

Mathematica [A]
time = 0.06, size = 134, normalized size = 0.73

$$\frac{\sqrt{d-c^2dx^2}\left(15a\sqrt{1-c^2x^2}\left(-2-c^2x^2+3c^4x^4\right)+b\left(30cx+5c^3x^3-9c^5x^5\right)+15b\sqrt{1-c^2x^2}\left(-2-c^2x^2+3c^4x^4\right)\mathrm{ArcSin}(cx)\right)}{225c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(15*a*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4) + b
*(30*c*x + 5*c^3*x^3 - 9*c^5*x^5) + 15*b*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 +
3*c^4*x^4)*ArcSin[c*x]))/(225*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.23, size = 544, normalized size = 2.97

method	result
default	$a\left(-\frac{x^2\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{5c^2d}-\frac{2\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{15dc^4}\right)+b\left(\frac{\sqrt{-d\left(c^2x^2-1\right)}\left(16c^6x^6-28c^4x^4-16i\sqrt{-c^2x^2+1}\,x^5c^5+13c^2\right.}{800c^4(}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2))+b*(
1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)
*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*
x*c-1)*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x
^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/(c^2*x^2-1)-1/16*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^4/(c
^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^
4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^4/(c^2*x
^2-1)-1/3600*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(1
7*I+15*arcsin(c*x))*cos(4*arcsin(c*x))/c^4/(c^2*x^2-1)-1/900*(-d*(c^2*x^2-1
))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(2*I+15*arcsin(c*x))*sin(4*ar
csin(c*x))/c^4/(c^2*x^2-1))
```

Maxima [A]
time = 0.49, size = 138, normalized size = 0.75

$$-\frac{1}{15}\,b\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)\arcsin\left(cx\right)-\frac{1}{15}\,a\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)-\frac{\left(9\,c^4\sqrt{d}\,x^5-5\,c^2\sqrt{d}\,x^3-30\,\sqrt{d}\,x\right)b}{225\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/15*b*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c
^4*d))*arcsin(c*x) - 1/15*a*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2
*d*x^2 + d)^(3/2)/(c^4*d)) - 1/225*(9*c^4*sqrt(d)*x^5 - 5*c^2*sqrt(d)*x^3 -
 30*sqrt(d)*x)*b/c^3
```

Fricas [A]
time = 2.91, size = 150, normalized size = 0.82

$$\frac{\left(9\,bc^5x^5-5\,bc^3x^3-30\,bcx\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+15\,\left(3\,ac^6x^6-4\,ac^4x^4-ac^2x^2+\left(3\,bc^6x^6-4\,bc^4x^4-bc^2x^2+2\,b\right)\arcsin\left(cx\right)+2\,a\right)\sqrt{-c^2dx^2+d}}{225\,\left(c^6x^2-c^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*((9*b*c^5*x^5 - 5*b*c^3*x^3 - 30*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^
2*x^2 + 1) + 15*(3*a*c^6*x^6 - 4*a*c^4*x^4 - a*c^2*x^2 + (3*b*c^6*x^6 - 4*b
*c^4*x^4 - b*c^2*x^2 + 2*b)*arcsin(c*x) + 2*a)*sqrt(-c^2*d*x^2 + d))/(c^6*x
^2 - c^4)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3}\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\,\left(a+b\,\mathrm{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{d-c^2\,d\,x^2}\,\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.64 $\int x\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=110

$$\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c^2d}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^2/d+1/3*b*x*(-c^2*d*x^2+d)^(1
/2)/c/(-c^2*x^2+1)^(1/2)-1/9*b*c*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2
)
```

Rubi [A]
time = 0.04, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}=0.040$, Rules used = {4767}

$$-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c^2d}+\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*x*Sqrt[d - c^2*d*x^2])/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*x^3*Sqrt[d - c^2*d
*x^2])/(9*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*c^2*d)
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\sqrt{d-c^2dx^2}\,\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{3c^2d}+\frac{\left(b\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)\,d}{3c\sqrt{1-c^2x^2}}$$

$$=\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx}{3c^2d}$$

Mathematica [A]
time = 0.06, size = 70, normalized size = 0.64

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{bc\left(x-\frac{c^2x^3}{3}\right)}{\sqrt{1-c^2x^2}}+(-1+c^2x^2)\,(a+b\mathrm{ArcSin}(cx))\right)}{3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((b*c*(x - (c^2*x^3)/3))/Sqrt[1 - c^2*x^2] + (-1 + c^2
*x^2)*(a + b*ArcSin[c*x])))/(3*c^2)
```

Maple [C] Result contains complex when optimal does not.
time = 0.13, size = 343, normalized size = 3.12

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b\Bigg(\frac{\sqrt{-d\,(c^2x^2-1)}\,\left(4c^4x^4-5c^2x^2-4i\sqrt{-c^2x^2+1}\,x^3c^3+3i\sqrt{-c^2x^2+1}\,xc+1\right)(i+3\,\mathrm{arcs}}{72c^2(c^2x^2-1)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/c^2/d*(-c^2*d*x^2+d)^(3/2)+b*(1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4
-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+
3*arcsin(c*x))/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*
x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/
72*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c
^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))
```

Maxima [A]
time = 0.50, size = 75, normalized size = 0.68

$$-\frac{(-c^2dx^2+d)^{\frac{3}{2}}b\arcsin(cx)}{3\,c^2d}-\frac{\left(c^2d^{\frac{3}{2}}x^3-3\,d^{\frac{3}{2}}x\right)b}{9\,cd}-\frac{(-c^2dx^2+d)^{\frac{3}{2}}a}{3\,c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/3*(-c^2*d*x^2 + d)^(3/2)*b*arcsin(c*x)/(c^2*d) - 1/9*(c^2*d^(3/2)*x^3 -
3*d^(3/2)*x)*b/(c*d) - 1/3*(-c^2*d*x^2 + d)^(3/2)*a/(c^2*d)
```

Fricas [A]
time = 2.83, size = 116, normalized size = 1.05

$$\frac{(bc^3x^3 - 3\,bcx)\sqrt{-c^2dx^2 + d}\,\sqrt{-c^2x^2 + 1} + 3\,(ac^4x^4 - 2\,ac^2x^2 + (bc^4x^4 - 2\,bc^2x^2 + b)\arcsin{(cx)} + a)\sqrt{-c^2dx^2 + d}}{9\,(c^4x^2 - c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9*((b*c^3*x^3 - 3*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3*(a*c
^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsin(c*x) + a)*sqrt(
-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{-d\,(cx - 1)\,(cx + 1)}\,(a + b\operatorname{asin}{(cx)})\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,(a + b\operatorname{asin}(c\,x))\,\sqrt{d - c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.65 $\int \frac{\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=203

$$-\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\cdots$$

```
[Out] (-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-b*c*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)-2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2
*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4783, 4803, 4268, 2317, 2438, 8}

$$\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{2\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{ib\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ib\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -((b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x^2]) + Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*A
rcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I
*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x}\,dx = \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) + \frac{\sqrt{d-c^2dx^2}\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(bc \right.}{}$$

$$= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) + \frac{\sqrt{d-c^2dx^2}\,\mathrm{Sub}}{}$$

$$= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2\sqrt{d-c^2dx^2}\,(a}{}$$

$$= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2\sqrt{d-c^2dx^2}\,(a}{}$$

$$= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2\sqrt{d-c^2dx^2}\,(a}{}$$

Mathematica [A]
time = 0.34, size = 187, normalized size = 0.92

$$a\sqrt{d-c^2dx^2} + a\sqrt{d}\,\log(x) - a\sqrt{d}\,\log\left(d+\sqrt{d}\,\sqrt{d-c^2dx^2}\right) + \frac{b\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx) + \mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right) - \mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right) + i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right) - i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] a*Sqrt[d - c^2*d*x^2] + a*Sqrt[d]*Log[x] - a*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d
 - c^2*d*x^2]] + (b*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*Ar
cSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c
*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [A]
time = 0.15, size = 413, normalized size = 2.03

method	result
default	$-\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)a+\sqrt{-c^2d\,x^2+d}\,a+\frac{b\sqrt{-d\,(c^2x^2-1)}\,\arcsin(cx)x^2c^2}{c^2x^2-1}+b\sqrt{\ }$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] -d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)*a+(-c^2*d*x^2+d)^(1/2)*
a+b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2+b*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c-b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x
^2-1)*arcsin(c*x)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*a
rcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*b*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*polylo
g(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x, x) - (sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x)
 + 2*d/abs(x)) - sqrt(-c^2*d*x^2 + d))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x, x)
```

3.66 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\textbf{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=225

$$-\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2-1/2*b*c*(-c^2*d*x^2+d)^(1/2
)/x/(-c^2*x^2+1)^(1/2)+c^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/
2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*I*b*c^2*polylog(2,-I*c*x-(-
c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/2*I*b*c^2*polyl
og(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4781, 30, 4803, 4268, 2317, 2438}

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*Sqrt[d - c^2*d*x^2])/(x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x]))/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((I/2)*b*c^2*Sqrt[d - c^2
*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((I/2)*b*c^2*Sq
rt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2x^2}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{1}{x^2}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(c^2\sqrt{d\right.}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2x^2}-\frac{\left(c^2\sqrt{d-c^2dx^2}\right)}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\,(a}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\,(a}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\,(a}{}$$

Mathematica [A]

time = 1.44, size = 239, normalized size = 1.06

$$\frac{1}{8}\left(-\frac{4a\sqrt{d-c^2dx^2}}{x^2}-4ac^2\sqrt{d}\log(x)+4ac^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bc^2d\sqrt{1-c^2x^2}\left(-2\cot\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\text{ArcSin}(cx)\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)-4\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)+4\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)-4i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)+4i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)-2\tan\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{d-c^2dx^2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] ((-4*a*Sqrt[d - c^2*d*x^2])/x^2 - 4*a*c^2*Sqrt[d]*Log[x] + 4*a*c^2*Sqrt[d]*
Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*c^2*d*Sqrt[1 - c^2*x^2]*(-2*Cot[A
rcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^
(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog
[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]
*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2])/8
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 461 vs. $2(221) = 442$.
time = 0.22, size = 462, normalized size = 2.05

method	result
default	$-\frac{a\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{2dx^2}+\frac{a\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right)c^2}{2}-\frac{a\sqrt{-c^2dx^2+d}\,c^2}{2}-\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\text{ar}}{2(c^2x^2-1)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(3/2)+1/2*a*d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x
^2+d)^(1/2))/x)*c^2-1/2*a*(-c^2*d*x^2+d)^(1/2)*c^2-1/2*b*(-d*(c^2*x^2-1))^(
1/2)/(c^2*x^2-1)*arcsin(c*x)*c^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x
*(-c^2*x^2+1)^(1/2)*c+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x^2*arcsin(c
*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2-2)*arcsin(c*
x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)*c^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2-2)*polylog(2,-I*c*x-(-c^2
*x^2+1)^(1/2))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(2*c^2*x^2
-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x^3, x) + 1/2*(c^2*sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt
(d)/abs(x) + 2*d/abs(x)) - sqrt(-c^2*d*x^2 + d)*c^2 - (-c^2*d*x^2 + d)^(3/2
)/(d*x^2))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**3, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{d-c^2\,d\,x^2}}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^3, x)
```

3.67 $\int \frac{\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{x^5}\,dx$

Optimal. Leaf size=301

$$-\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{4x^4}+\frac{c^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8x^2}+$$

```
[Out] -1/4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4+1/8*c^2*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/x^2-1/12*b*c*(-c^2*d*x^2+d)^(1/2)/x^3/(-c^2*x^2+1)^(1/2
)+1/8*b*c^3*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+1/4*c^4*(a+b*arcsin(c
*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)-1/8*I*b*c^4*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+1/8*I*b*c^4*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.20, antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4781, 30, 4789, 4803, 4268, 2317, 2438}

$$\frac{c^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8x^2}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{4x^4}+\frac{c^4\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4\sqrt{1-c^2x^2}}-\frac{ibc^4\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{8\sqrt{1-c^2x^2}}+\frac{ibc^4\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] -1/12*(b*c*Sqrt[d - c^2*d*x^2])/(x^3*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c
^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(4*x^4) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*x^2) + (c^4*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt
[1 - c^2*x^2]) - ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2] + ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I
*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x^5}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{4x^4} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{1}{x^4}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(c^2\sqrt{\right.}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{4x^4} + \frac{c^2\sqrt{d-c^2dx^2}}{}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx}{4x^4}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx}{4x^4}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx}{4x^4}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx}{4x^4}$$

Mathematica [A]
time = 2.88, size = 321, normalized size = 1.07

$$\frac{a(-2+c^2x^2)\sqrt{d-c^2dx^2}}{8x^4} - \frac{1}{8}ac^4\sqrt{d}\log(x) + \frac{1}{8}ac^4\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{bc^4\sqrt{d-c^2dx^2}\left(8\cot\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) + 6\mathrm{ArcSin}(cx)\csc^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - cx\csc^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 3\mathrm{ArcSin}(cx)\csc^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 24\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right) + 24\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right) - 24i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right) + 24i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right) - 6\mathrm{ArcSin}(cx)\sec^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) + 3\mathrm{ArcSin}(cx)\sec^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - \frac{16\sin^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)}{c^3x^3} + 8\tan\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}{192\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*(-2 + c^2*x^2)*Sqrt[d - c^2*d*x^2])/(8*x^4) - (a*c^4*Sqrt[d]*Log[x])/8 +
 (a*c^4*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/8 + (b*c^4*Sqrt[d - c
^2*d*x^2]*(8*Cot[ArcSin[c*x]/2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - c*x*
Csc[ArcSin[c*x]/2]^4 - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcSin[c*x]*
Log[1 - E^(I*ArcSin[c*x])] + 24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (2
4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin[c*x])]
- 6*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^4 -
 (16*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*Sqrt[1 -
 c^2*x^2])
```

Maple [A]
time = 0.28, size = 571, normalized size = 1.90

method	result

default	$-\frac{a(-c^2 d x^2+d)^{\frac{3}{2}}}{4d x^4}-\frac{a c^2(-c^2 d x^2+d)^{\frac{3}{2}}}{8d x^2}+\frac{a c^4 \sqrt{d}\, \ln\left(\frac{2d+2\sqrt{d}\, \sqrt{-c^2 d x^2+d}}{x}\right)}{8}-\frac{a c^4 \sqrt{-c^2 d x^2+d}}{8}+\frac{b\sqrt{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(3/2)-1/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(3/2)+1/8*
a*c^4*d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-1/8*a*c^4*(-c^2*d*
x^2+d)^(1/2)+1/8*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c^4-1/8*b
*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x*(-c^2*x^2+1)^(1/2)*c^3-3/8*b*(-d*(c^2
*x^2-1))^(1/2)/(c^2*x^2-1)/x^2*arcsin(c*x)*c^2+1/12*b*(-d*(c^2*x^2-1))^(1/2
)/(c^2*x^2-1)/x^3*(-c^2*x^2+1)^(1/2)*c+1/4*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^
2-1)/x^4*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4/(8*c^2
*x^2-8)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)*c^4/(8*c^2*x^2-8)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(
1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^4/(8*c^2*x^2-8)*polyl
og(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)*c^4/(8*c^2*x^2-8)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x^5, x) + 1/8*(c^4*sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt
(d)/abs(x) + 2*d/abs(x)) - sqrt(-c^2*d*x^2 + d)*c^4 - (-c^2*d*x^2 + d)^(3/2
)*c^2/(d*x^2) - 2*(-c^2*d*x^2 + d)^(3/2)/(d*x^4))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^5, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\operatorname{asin}(cx))}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**5, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^5,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^5, x)
```

3.68 $\int x^4(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=340

$$\frac{3bdx^2\sqrt{d-c^2dx^2}}{256c^3\sqrt{1-c^2x^2}}+\frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{3dx\sqrt{d-c^2dx^2}\,(a+b\text{Arc}}{128c^4}$$

```
[Out] 1/8*x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-3/128*d*x*(a+b*arcsin(c*x))*
(-c^2*d*x^2+d)^(1/2)/c^4-1/64*d*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/
c^2+1/16*d*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+3/256*b*d*x^2*(-c^2*d
*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/256*b*d*x^4*(-c^2*d*x^2+d)^(1/2)/c/(
-c^2*x^2+1)^(1/2)-1/32*b*c*d*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/
64*b*c^3*d*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/256*d*(a+b*arcsin(
c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^5/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.28, antiderivative size = 340, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}=0.222$, Rules used = {4787, 4783, 4795, 4737, 30, 14}

$$\frac{1}{8}x^5(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))+\frac{1}{16}dx^5\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{dx^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{64c^2}+\frac{3d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{256bc^5\sqrt{1-c^2x^2}}-\frac{3dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{128c^4}-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}+\frac{3bdx^2\sqrt{d-c^2dx^2}}{256c^3\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*x^2*Sqrt[d - c^2*d*x^2])/(256*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^4*Sqrt
[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (b*c*d*x^6*Sqrt[d - c^2*d*x^2]
)/(32*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^8*Sqrt[d - c^2*d*x^2])/(64*Sqrt[1 - c
^2*x^2]) - (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^4) - (d*x
^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(64*c^2) + (d*x^5*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x]))/8 + (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(256*b*c^5*Sqrt[1
 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}(3d)\int x^4\sqrt{d-c^2dx^2}\,(a$$

$$=\frac{1}{16}dx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}\left(a+b\,\mathrm{s}\right.$$

$$=-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{dx^3\sqrt{d-c^2dx^2}\,(a}{64c^2}$$

$$=\frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-$$

$$=\frac{3bdx^2\sqrt{d-c^2dx^2}}{256c^3\sqrt{1-c^2x^2}}+\frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{b}{}$$

Mathematica [A]
time = 0.12, size = 193, normalized size = 0.57

$$\frac{d\sqrt{d-c^2dx^2}\left(3a^2+b^2c^2x^2(3+c^2x^2-8c^4x^4+4c^6x^6)-2abcx\sqrt{1-c^2x^2}\,(3+2c^2x^2-24c^4x^4+16c^6x^6)-2b\left(-3a+bcx\sqrt{1-c^2x^2}\,(3+2c^2x^2-24c^4x^4+16c^6x^6)\right)\mathrm{ArcSin}(cx)+3b^2\mathrm{ArcSin}(cx)^2\right)}{256bc^5\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(3*a^2 + b^2*c^2*x^2*(3 + c^2*x^2 - 8*c^4*x^4 + 4*c^
6*x^6) - 2*a*b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x
^6) - 2*b*(-3*a + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2 - 24*c^4*x^4 + 16*
c^6*x^6))*ArcSin[c*x] + 3*b^2*ArcSin[c*x]^2))/(256*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.47, size = 770, normalized size = 2.26

method	result
default	$-\frac{a\,x^3\left(-c^2d\,x^2+d\right)^{\frac{5}{2}}}{8c^2d}-\frac{ax\left(-c^2d\,x^2+d\right)^{\frac{5}{2}}}{16c^4d}+\frac{ax\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}}{64c^4}+\frac{3adx\sqrt{-c^2d\,x^2+d}}{128c^4}+\frac{3a\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right.}{128c^4\sqrt{c^2d}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*a*x^3*(-c^2*d*x^2+d)^(5/2)/c^2/d-1/16*a/c^4*x*(-c^2*d*x^2+d)^(5/2)/d+1
/64*a/c^4*x*(-c^2*d*x^2+d)^(3/2)+3/128*a/c^4*d*x*(-c^2*d*x^2+d)^(1/2)+3/128
```

```
*a/c^4*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3
/256*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^
2*d-1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c
^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-c^2*x^2+1)^(1/2
)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-88*c^3*x^3-I*(-c^2*x^
2+1)^(1/2)+8*c*x)*(I+8*arcsin(c*x))*d/c^5/(c^2*x^2-1)+1/1024*(-d*(c^2*x^2-1
))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*
x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*d/c^5/(c^2
*x^2-1)+1/1024*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5
*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*
(-I+4*arcsin(c*x))*d/c^5/(c^2*x^2-1)-1/16384*(-d*(c^2*x^2-1))^(1/2)*(128*I*
(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320
*c^7*x^7+160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1)^(1/
2)*x^2*c^2-88*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+8*c*x)*(-I+8*arcsin(c*x))*d/c^5/
(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(-(c^2*d*x^6 - d*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) - 1/128*(16*(-c^2*d*x^2 + d)^(5/2
)*x^3/(c^2*d) - 2*(-c^2*d*x^2 + d)^(3/2)*x/c^4 + 8*(-c^2*d*x^2 + d)^(5/2)*x
/(c^4*d) - 3*sqrt(-c^2*d*x^2 + d)*d*x/c^4 - 3*d^(3/2)*arcsin(c*x)/c^5)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^6 - a*d*x^4 + (b*c^2*d*x^6 - b*d*x^4)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^4(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
[Out] Integral(x**4*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^4, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.69 $\int x^2 (d - c^2 d x^2)^{3/2} (a + b\textbf{ArcSin}(cx))\, dx$

Optimal. Leaf size=265

$$\frac{bdx^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{16c^2}+\frac{1}{8}dx^3\sqrt{d}$$

```
[Out] 1/6*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-1/16*d*x*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/c^2+1/8*d*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/
32*b*d*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-7/96*b*c*d*x^4*(-c^2*d
*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/36*b*c^3*d*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^
2*x^2+1)^(1/2)+1/32*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*
x^2+1)^(1/2)
```

Rubi [A]
time = 0.21, antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4787, 4783, 4795, 4737, 30, 14}

$$-\frac{dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{16c^2}+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))+\frac{1}{8}dx^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{32bc^3\sqrt{1-c^2x^2}}+\frac{bdx^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x^2*Sqrt[d - c^2*d*x^2])/(32*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[
d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqrt[d - c^2*d*x^2])/
(36*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*
c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 + (x^3*(d - c^2*d*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^2)/(32*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)\, dx = \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d\int x^2\sqrt{d-c^2dx^2}\,\left(a-\right.$$

$$=\frac{1}{8}dx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\right.$$

$$=-\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{dx\sqrt{d-c^2dx^2}\,(}{16}$$

$$=\frac{bdx^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.11, size = 170, normalized size = 0.64

$$\frac{d\sqrt{d-c^2dx^2}\left(9a^2+b^2c^2x^2(9-21c^2x^2+8c^4x^4)-6abcx\sqrt{1-c^2x^2}\,(3-14c^2x^2+8c^4x^4)+6b\left(3a+bcx\sqrt{1-c^2x^2}\,(-3+14c^2x^2-8c^4x^4)\right)\mathrm{ArcSin}(cx)+9b^2\mathrm{ArcSin}(cx)^2\right)}{288bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(9*a^2 + b^2*c^2*x^2*(9 - 21*c^2*x^2 + 8*c^4*x^4) -
6*a*b*c*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + 6*b*(3*a + b*c*x
*Sqrt[1 - c^2*x^2]*(-3 + 14*c^2*x^2 - 8*c^4*x^4))*ArcSin[c*x] + 9*b^2*ArcSi
n[c*x]^2))/(288*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.27, size = 682, normalized size = 2.57

method	result
default	$-\frac{ax\left(-c^2d\,x^2+d\right)^{\frac{5}{2}}}{6c^2d}+\frac{ax\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}}{24c^2}+\frac{adx\sqrt{-c^2d\,x^2+d}}{16c^2}+\frac{a\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{16c^2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*a*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/24*a/c^2*x*(-c^2*d*x^2+d)^(3/2)+1/16*
a/c^2*d*x*(-c^2*d*x^2+d)^(1/2)+1/16*a/c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*d-1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*
(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^
```

```
5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x
)*(I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(
c*x))*d/c^3/(c^2*x^2-1)+1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*
x^2+1)^(1/2)-I)*(11*I+24*arcsin(c*x))*cos(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-
1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(7*I+48*
arcsin(c*x))*sin(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1
/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(I+8*arcsin(c*x))*cos(3*arcsin(c*x
))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+
1)^(1/2)-I)*sin(3*arcsin(c*x))*d/c^3/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(-(c^2*d*x^4 - d*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/48*a*(2*(-c^2*d*x^2 + d)^(3/2
)*x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c
^2 + 3*d^(3/2)*arcsin(c*x)/c^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^4 - a*d*x^2 + (b*c^2*d*x^4 - b*d*x^2)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.70 $\int \left(d-c^2dx^2\right)^{3/2} (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=188

$$-\frac{5bcdx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{3}{8}dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcS}$$

```
[Out] 1/4*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+3/8*d*x*(a+b*arcsin(c*x))*(-c^
2*d*x^2+d)^(1/2)-5/16*b*c*d*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/1
6*b*c^3*d*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/16*d*(a+b*arcsin(c*
x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.08, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4743, 4741, 4737, 30, 14}

$$\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))+\frac{3}{8}dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{3d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{16bc\sqrt{1-c^2x^2}}-\frac{5bcdx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*b*c*d*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^4*Sq
rt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 + (x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}(3d)\int\sqrt{d-c^2dx^2}\,\left(a+b\right.$$

$$=\frac{3}{8}dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-\right.$$

$$=-\frac{5bcdx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{3}{8}dx\sqrt{d-c^2dx^2}\,\left(a\right.$$

Mathematica [A]
time = 0.35, size = 210, normalized size = 1.12

$$\frac{24bd\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)^2-48ad^{3/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+d\sqrt{d-c^2dx^2}\left(16acx(5-2c^2x^2)\sqrt{1-c^2x^2}+16b\cos(2\text{ArcSin}(cx))+b\cos(4\text{ArcSin}(cx))\right)+4bd\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)(8\sin(2\text{ArcSin}(cx))+\sin(4\text{ArcSin}(cx)))}{128c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 - 48*a*d^(3/2)*Sqrt[1 - c^2*x^2]*
ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + d*Sqrt[d - c^2
*d*x^2]*(16*a*c*x*(5 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 16*b*Cos[2*ArcSin[c*x
]] + b*Cos[4*ArcSin[c*x]]) + 4*b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(8*Sin[2
*ArcSin[c*x]] + Sin[4*ArcSin[c*x]]))/(128*c*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.10, size = 480, normalized size = 2.55

method	result
default	$\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{4}+\frac{3adx\sqrt{-c^2d\,x^2+d}}{8}+\frac{3a\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{8\sqrt{c^2d}}+b\left(-\frac{3\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2}}{16c(c^2x^2-1}\right.$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/4*a*x*(-c^2*d*x^2+d)^(3/2)+3/8*a*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d-1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*d/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d/c/(c^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(5*I+12*arcsin(c*x))*sin(3*arcsin(c*x))*d/c/(c^2*x^2-1))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] b*sqrt(d)*integrate(-(c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*arcsin(c*x)/c)*a

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.71 $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\mathbf{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=185

$$\frac{bc^3dx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))}{x}-\frac{3cd\sqrt{d-c^2dx}}{4b}$$

```
[Out] -(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x-3/2*c^2*d*x*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)+1/4*b*c^3*d*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3
/4*c*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+b*c*d*
ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {4785, 4741, 4737, 30, 14}

$$-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{3cd\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{4b\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))}{x}+\frac{bcd\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{bc^3dx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*c^3*d*x^2*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) - (3*c^2*d*x*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin
[c*x]))/x - (3*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 -
 c^2*x^2]) + (b*c*d*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x} - \left(3c^2d\right)\int \sqrt{d-c^2dx^2}\,\left(a+b\,\mathrm{s}\right.$$

$$= -\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}\right.}{x}$$

$$= \frac{bc^3dx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{(d-}{}$$

Mathematica [A]
time = 0.37, size = 222, normalized size = 1.20

$$\left(-\frac{ad}{x}-\frac{1}{2}ac^2dx\right)\sqrt{-d\left(-1+c^2x^2\right)}+\frac{3}{2}acd^{3/2}\text{ArcTan}\left(\frac{cx\sqrt{-d\left(-1+c^2x^2\right)}}{\sqrt{d}\left(-1+c^2x^2\right)}\right)-\frac{bcd\sqrt{d\left(1-c^2x^2\right)}\left(\frac{2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{cx}+\text{ArcSin}(cx)^2-2\log(cx)\right)}{2\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d\left(1-c^2x^2\right)}\left(\cos(2\text{ArcSin}(cx))+2\text{ArcSin}(cx)(\text{ArcSin}(cx)+\sin(2\text{ArcSin}(cx)))\right)}{8\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-((a*d)/x) - (a*c^2*d*x)/2)*Sqrt[-(d*(-1 + c^2*x^2))] + (3*a*c*d^(3/2)*Arc
Tan[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/2 - (b*c*d*S
qrt[d*(1 - c^2*x^2)]*((2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]
^2 - 2*Log[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (b*c*d*Sqrt[d*(1 - c^2*x^2)]*(Cos
```

```
[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x] + Sin[2*ArcSin[c*x]])))/(8*Sqr
t[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.22, size = 464, normalized size = 2.51

method	result
default	$-\frac{a(-c^2 d x^2+d)^{\frac{5}{2}}}{dx}-a c^2 x(-c^2 d x^2+d)^{\frac{3}{2}}-\frac{3a c^2 dx\sqrt{-c^2 d x^2+d}}{2}-\frac{3a c^2 d^2 \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d x^2+d}}\right)}{2\sqrt{c^2 d}}+\frac{3b}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(5/2)-a*c^2*x*(-c^2*d*x^2+d)^(3/2)-3/2*a*c^2*d*x*(-c^
2*d*x^2+d)^(1/2)-3/2*a*c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2))+3/4*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*
arcsin(c*x)^2*d*c-1/2*b*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x
)*x^3-1/4*b*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2
+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*d*c-
1/2*b*(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)*x+1/8*b*(-d*(c^2
*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+b*(-d*(c^2*x^2-1))^(1/2)*
arcsin(c*x)*d/(c^2*x^2-1)/x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^
2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d*c
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^2, x) - 1/2*(3*sqrt(-c^2*d*x^2 + d)*c^2
*d*x + 3*c*d^(3/2)*arcsin(c*x) + 2*(-c^2*d*x^2 + d)^(3/2)/x)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^2, x)
```

3.72 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=191

$$-\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}+\frac{c^2d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3x^3}+\frac{c^3d\sqrt{d-c^2dx^2}\,(\ldots}{2b\sqrt{1\ldots}}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3+c^2*d*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)/x-1/6*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)+1
/2*c^3*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)-4/3*
b*c^3*d*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {4785, 4781, 29, 4737, 14}

$$\frac{c^2d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3x^3}+\frac{c^3d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2b\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{4bc^3d\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^2*Sqrt[1 - c^2*x^2]) + (c^2*d*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/x - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/(3*x^3) + (c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[
1 - c^2*x^2]) - (4*b*c^3*d*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2]
)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^4}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^3} - \left(c^2d\right)\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{x^2}$$

$$= \frac{c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x} - \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right.}{3x^3}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} + \frac{c^2d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x} - \frac{\left(d-c^2dx\right.}{}$$

Mathematica [A]
time = 0.48, size = 211, normalized size = 1.10

$$\frac{bd\left(-1+4c^2x^2\right)\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)}{3x^3}+\frac{bc^3d\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)^2}{2\sqrt{1-c^2x^2}}-ac^3d^{3/2}\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,\left(-1+c^2x^2\right)}\right)-\frac{d\sqrt{d-c^2dx^2}\,\left(bcx+2a\left(1-4c^2x^2\right)\sqrt{1-c^2x^2}+8bc^3x^3\log(cx)\right)}{6x^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*d*(-1 + 4*c^2*x^2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(3*x^3) + (b*c^3*d*S
qrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/(2*Sqrt[1 - c^2*x^2]) - a*c^3*d^(3/2)*Arc
Tan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - (d*Sqrt[d - c^2*d
```

```
*x^2]*(b*c*x + 2*a*(1 - 4*c^2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c^3*x^3*Log[c*x]
))/(6*x^3*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.28, size = 1289, normalized size = 6.75

method	result
default	$-\frac{a\left(-c^{2} d \,x^{2}+d \right)^{\frac{5}{2}}}{3 d \,x^{3}}+\frac{2 a \,c^{2} \left(-c^{2} d \,x^{2}+d \right)^{\frac{5}{2}}}{3 d x}+\frac{2 a \,c^{4} x \left(-c^{2} d \,x^{2}+d \right)^{\frac{3}{2}}}{3}+a \,c^{4} d x \sqrt{-c^{2} d \,x^{2}+d}+\frac{a \,c^{4} d^{2} \arctan\left(\frac{\sqrt{c^{2}}}{\sqrt{-c^{2} d}}\right)}{\sqrt{c^{2} d}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(5/2)+2/3*a*c^2/d/x*(-c^2*d*x^2+d)^(5/2)+2/3*a*
c^4*x*(-c^2*d*x^2+d)^(3/2)+a*c^4*d*x*(-c^2*d*x^2+d)^(1/2)+a*c^4*d^2/(c^2*d)
^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*b*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*d*c^3+4/3*I*b*(-d*(c^2*x
^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*c^3+10/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/
(c^2*x^2-1)*c^6+32*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/
(c^2*x^2-1)*arcsin(c*x)*c^8-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*
c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4
-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-2/3*I*b*(-d*(c^2*x^2-1))^(1/
2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*c^4-52*b*(-d*(c^2*x^2-1))^(1/2)
*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+32*I*b*(-d*(c^2
*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)*c^7-12*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*
x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+4*b*(-d*(c^2*x^2-1))^(1/
2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5-8*I*b*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*d*c^3/(3*c^2*x^2-3)+7
3/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*arcsi
n(c*x)*c^4+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2
*x^2-1)*(-c^2*x^2+1)*c^4-3/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x
^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-14/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(2
4*c^4*x^4-9*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^2+1/6*b*(-d*(c^2*x^2-1))
^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/3*
b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(
c*x)+4/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+
(-c^2*x^2+1)^(1/2))^2-1)*d*c^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^4, x) + 1/3*(3*sqrt(-c^2*d*x^2 + d)*c^4
*d*x + 3*c^3*d^(3/2)*arcsin(c*x) + 2*(-c^2*d*x^2 + d)^(3/2)*c^2/x - (-c^2*d
*x^2 + d)^(5/2)/(d*x^3))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^4, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**4, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^4,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^4, x)
```

3.73 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))}{x^6}\,dx$

Optimal. Leaf size=154

$$-\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{5dx^5}+\frac{bc^5d\sqrt{d-c^2dx^2}\,\log(x)}{5\sqrt{1-c^2x^2}}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^5-1/20*b*c*d*(-c^2*d*x^2+d)
^(1/2)/x^4/(-c^2*x^2+1)^(1/2)+1/5*b*c^3*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^
2+1)^(1/2)+1/5*b*c^5*d*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4771, 272, 45}

$$-\frac{(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{5dx^5}-\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^5d\log(x)\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -1/20*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(5*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*Ar
cSin[c*x]))/(5*d*x^5) + (b*c^5*d*Sqrt[d - c^2*d*x^2]*Log[x])/(5*Sqrt[1 - c^
2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
```

```
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{x^6}dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{5dx^5}+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2}{x^5}d}{5\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{5dx^5}+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-}{}\right.}{10\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{5dx^5}+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{x^{}}\right.\right.}{10\sqrt{1-c^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}}{5dx^5}$$

Mathematica [A]
time = 0.13, size = 144, normalized size = 0.94

$$-\frac{d\sqrt{d-c^2dx^2}\left(12a(-1+c^2x^2)^3+bcx\sqrt{1-c^2x^2}\,(-3+12c^2x^2-25c^4x^4)+12b(-1+c^2x^2)^3\,\text{ArcSin}(cx)\right)}{60x^5\,(-1+c^2x^2)}+\frac{bc^5d\sqrt{d-c^2dx^2}\,\log(x)}{5\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -1/60*(d*Sqrt[d - c^2*d*x^2]*(12*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 - c^2*x^
2]*(-3 + 12*c^2*x^2 - 25*c^4*x^4) + 12*b*(-1 + c^2*x^2)^3*ArcSin[c*x]))/(x^
5*(-1 + c^2*x^2)) + (b*c^5*d*Sqrt[d - c^2*d*x^2]*Log[x])/(5*Sqrt[1 - c^2*x^
2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.33, size = 2350, normalized size = 15.26

method	result	size
default	Expression too large to display	2350

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^
2*x^2+1)^(1/2))^2-1)*d*c^5+1/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6
```

```
*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^5/(c^2*x^2-1)*arcsin(c*x)+3/2*b*(-d*(c^2*x^2
-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/(c^2*x^2-1)*(-c^
2*x^2+1)^(1/2)*c^5-1/5*a/d/x^5*(-c^2*d*x^2+d)^(5/2)+2*I*b*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*d*c^5/(5*c^2*x^2-5)+1/5*I*b*(-d*(c^2*x
^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^9/(c^2*x^2-1
)*c^14-13/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-
5*c^2*x^2+1)*x^7/(c^2*x^2-1)*c^12+3/4*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x
^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^10+9/4*b*(-d*(c^2*x
^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^4/(c^2*x^2-1
)*(-c^2*x^2+1)^(1/2)*c^9-7/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^
6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^8+1/20*I*b*(-d*(c^2*x^2-1))
^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x/(c^2*x^2-1)*c^6+28
/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
/x/(c^2*x^2-1)*arcsin(c*x)*c^4-9/20*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-1
0*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-8/
5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/
x^3/(c^2*x^2-1)*arcsin(c*x)*c^2-b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^
6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^14+5*b*(-d*(c^2
*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^7/(c^2*x^2
-1)*arcsin(c*x)*c^12+1/20*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+
10*c^4*x^4-5*c^2*x^2+1)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-11*b*(-d*(c^2*
x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^5/(c^2*x^2-
1)*arcsin(c*x)*c^10-b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4
*x^4-5*c^2*x^2+1)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11+14*b*(-d*(c^2*x^2
-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3/(c^2*x^2-1)*
arcsin(c*x)*c^8-5/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4
*x^4-5*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7-56/5*b*(-d*(c^2*x^
2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x/(c^2*x^2-1)*a
rcsin(c*x)*c^6-9/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c
^4*x^4-5*c^2*x^2+1)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^10+3/10*I*b*(-d*(c^2*x^2
-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3/(c^2*x^2-1)*
(-c^2*x^2+1)*c^8-1/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10
*c^4*x^4-5*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-1/5*I*b*(-d*(c^2*x^2-1
))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/(c^2*x^2-1)*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c^5+1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10
*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12+I*b*(-d*
(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^2/(c^2
*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7+2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(
5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^6/(c^2*x^2-1)*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*c^11-2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+
10*c^4*x^4-5*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9-
I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*
x^8/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^13
```

Maxima [A]

time = 0.48, size = 172, normalized size = 1.12

$$-\frac{\left(2\,(-1)^{-2\,c^2dx^2+2\,d}\,c^4d^{\frac{5}{2}}\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+2\,c^4d^{\frac{5}{2}}\log\left(x^2-\frac{1}{c^2}\right)-\frac{3\,\sqrt{c^4dx^4-2\,c^2dx^2+d}\,c^2d^2}{x^2}+\frac{\sqrt{c^4dx^4-2\,c^2dx^2+d}\,d^2}{x^4}\right)bc}{20\,d}-\frac{(-c^2dx^2+d)^{\frac{5}{2}}\,b\arcsin(cx)}{5\,dx^5}-\frac{(-c^2dx^2+d)^{\frac{5}{2}}\,a}{5\,dx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/20*(2*(-1)^(-2*c^2*d*x^2 + 2*d)*c^4*d^(5/2)*log(-2*c^2*d + 2*d/x^2) + 2*
c^4*d^(5/2)*log(x^2 - 1/c^2) - 3*sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*c^2*d^2/
x^2 + sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*d^2/x^4)*b*c/d - 1/5*(-c^2*d*x^2 +
d)^(5/2)*b*arcsin(c*x)/(d*x^5) - 1/5*(-c^2*d*x^2 + d)^(5/2)*a/(d*x^5)
```

Fricas [**A**]
time = 2.92, size = 525, normalized size = 3.41

$$\left[\frac{2\,(bc^7dx^7-bc^5dx^5)\sqrt{d}\,\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-(4\,bc^3dx^3-(4\,bc^3-bc)dx^5-bcdx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}-4\,(ac^6dx^6-3\,ac^4dx^4+3\,ac^2dx^2-ad+(bc^6dx^6-3\,bc^4dx^4+3\,bc^2dx^2-bd)\arcsin(cx))\sqrt{-c^2dx^2+d}}{20\,(c^2x^7-x^5)},\ \frac{4\,(bc^7dx^7-bc^5dx^5)\sqrt{-d}\,\arctan\left(\frac{\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)-(4\,bc^3dx^3-(4\,bc^3-bc)dx^5-bcdx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}-4\,(ac^6dx^6-3\,ac^4dx^4+3\,ac^2dx^2-ad+(bc^6dx^6-3\,bc^4dx^4+3\,bc^2dx^2-bd)\arcsin(cx))\sqrt{-c^2dx^2+d}}{20\,(c^2x^7-x^5)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [1/20*(2*(b*c^7*d*x^7 - b*c^5*d*x^5)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d
*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*
x^4 - x^2)) - (4*b*c^3*d*x^3 - (4*b*c^3 - b*c)*d*x^5 - b*c*d*x)*sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(a*c^6*d*x^6 - 3*a*c^4*d*x^4 + 3*a*c^2*d*x
^2 - a*d + (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d*x^2 - b*d)*arcsin(c*x))
*sqrt(-c^2*d*x^2 + d))/(c^2*x^7 - x^5), 1/20*(4*(b*c^7*d*x^7 - b*c^5*d*x^5)
*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)
/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) - (4*b*c^3*d*x^3 - (4*b*c^3 - b*c)*d*x^
5 - b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(a*c^6*d*x^6 - 3*a
*c^4*d*x^4 + 3*a*c^2*d*x^2 - a*d + (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d
*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^7 - x^5)]
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**6, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))\,\left(d - c^2\,d\,x^2\right)^{3/2}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^6,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^6, x)
```

3.74 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\textbf{ArcSin}(cx))}{x^8}\,dx$

Optimal. Leaf size=231

$$-\frac{bcd\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))}{7dx^7}-\frac{2c^2(d-c^2dx^2}{}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^7-2/35*c^2*(-c^2*d*x^2+d)^(
5/2)*(a+b*arcsin(c*x))/d/x^5-1/42*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+
1)^(1/2)+2/35*b*c^3*d*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-1/70*b*c^
5*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)+2/35*b*c^7*d*ln(x)*(-c^2*d*
x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {277, 270, 4779, 12, 457, 77}

$$-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))}{7dx^7}-\frac{2c^2(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))}{35dx^5}-\frac{bcd\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{2bc^7d\log(x)\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}}+\frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/42*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*Sqrt
[d - c^2*d*x^2])/(35*x^4*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])
/(70*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(
7*d*x^7) - (2*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) + (
2*b*c^7*d*Sqrt[d - c^2*d*x^2]*Log[x])/(35*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 77

```
Int[((d_.)*(x_))^(n_.)*((a_) + (b_.)*(x_))*((e_) + (f_.)*(x_))^(p_.), x_Sym
bol] :> Int[ExpandIntegrand[(a + b*x)*(d*x)^n*(e + f*x)^p, x], x] /; FreeQ[
{a, b, d, e, f, n}, x] && IGtQ[p, 0] && (NeQ[n, -1] || EqQ[p, 1]) && NeQ[b*
e + a*f, 0] && ( !IntegerQ[n] || LtQ[9*p + 5*n, 0] || GeQ[n + p + 1, 0] ||
(GeQ[n + p + 2, 0] && RationalQ[a, b, d, e, f])) && (NeQ[n + p + 3, 0] || E
qQ[p, 1])
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{x^8}\,dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{(-5-2c^2x^2)(1-c^2x^2)^2}{35x^7}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(cx)\right)\int$$

$$= -\frac{(d-c^2dx^2)^{5/2}\,(a+b\sin^{-1}(cx))}{7dx^7} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{(-5-2c^2x^2}{x}}{35\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}\,(a+b\sin^{-1}(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}\,(a+b\sin^{-1}(}{35dx^5}$$

$$= -\frac{(d-c^2dx^2)^{5/2}\,(a+b\sin^{-1}(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}\,(a+b\sin^{-1}(}{35dx^5}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}} - (d-$$

Mathematica [A]
time = 0.13, size = 173, normalized size = 0.75

$$-\frac{d\sqrt{d-c^2dx^2}\left(30a(-1+c^2x^2)^3(5+2c^2x^2)-bcx\sqrt{1-c^2x^2}(25-60c^2x^2+15c^4x^4+147c^6x^6)+30b(-1+c^2x^2)^3(5+2c^2x^2)\text{ArcSin}(cx)\right)}{1050x^7(-1+c^2x^2)}+\frac{2bc^7d\sqrt{d-c^2dx^2}\log(x)}{35\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/1050*(d*Sqrt[d - c^2*d*x^2]*(30*a*(-1 + c^2*x^2)^3*(5 + 2*c^2*x^2) - b*c
*x*Sqrt[1 - c^2*x^2]*(25 - 60*c^2*x^2 + 15*c^4*x^4 + 147*c^6*x^6) + 30*b*(-
1 + c^2*x^2)^3*(5 + 2*c^2*x^2)*ArcSin[c*x]))/(x^7*(-1 + c^2*x^2)) + (2*b*c^
7*d*Sqrt[d - c^2*d*x^2]*Log[x])/(35*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.40, size = 3384, normalized size = 14.65

method	result	size
default	Expression too large to display	3384

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x,method=_RETURNVERBOSE)
```

```
[Out] -25/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154
*c^4*x^4-105*c^2*x^2+25)*x^3/(c^2*x^2-1)*c^10+5/21*I*b*(-d*(c^2*x^2-1))^(1/
2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x/(c^2
*x^2-1)*c^8-2*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^
6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(c^2*x^2-1)*arcsin(c*x)*c^18+3*b*(-d*(c^
2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x
^2+25)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^16+1/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*
c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^8/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*c^15+12*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8
*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^1
4-5/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^
4*x^4-105*c^2*x^2+25)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13-164/5*b*(-d*(
c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2
*x^2+25)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^12+11/6*b*(-d*(c^2*x^2-1))^(1/2)*d/(
35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^4/(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)*c^11+52/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-3
5*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^3/(c^2*x^2-1)*arcsin(c*x
)*c^10+161/30*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^
6+154*c^4*x^4-105*c^2*x^2+25)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9+1966/3
5*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^
4-105*c^2*x^2+25)*x/(c^2*x^2-1)*arcsin(c*x)*c^8-3272/35*b*(-d*(c^2*x^2-1))^
(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x/(
```

c^2*x^2-1)*arcsin(c*x)*c^6+421/42*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+472/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^4-55/14*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-170/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+4*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*d*c^7/(35*c^2*x^2-35)-2/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^13/(c^2*x^2-1)*c^20+9/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(c^2*x^2-1)*c^18+1/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*c^16-142/105*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*c^14+72/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^5/(c^2*x^2-1)*c^12+a*(-1/7/d/x^7*(-c^2*d*x^2+d)^(5/2)-2/35*c^2/d/x^5*(-c^2*d*x^2+d)^(5/2))+25/42*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+6*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^9-2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^10/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^17+2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^15+4*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^13-44/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^11+1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*(-c^2*x^2+1)*c^16+26/105*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^14-116/105*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^12+20/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^10-5/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^8-10/7*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^7-2/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^18+25/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^7/(c^2*x^2-1)*arcsin(c*x)-2/35*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d*...

Maxima [A]
time = 0.49, size = 151, normalized size = 0.65

$$\frac{1}{210}\left(12\,c^{6}d^{\frac{3}{2}}\log\left(x\right)-\frac{3\,c^{4}d^{\frac{3}{2}}x^{4}-12\,c^{2}d^{\frac{3}{2}}x^{2}+5\,d^{\frac{3}{2}}}{x^{6}}\right)bc-\frac{1}{35}\,b\left(\frac{2\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{2}}{dx^{5}}+\frac{5\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}}{dx^{7}}\right)\arcsin\left(cx\right)-\frac{1}{35}\,a\left(\frac{2\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{2}}{dx^{5}}+\frac{5\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}}{dx^{7}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] 1/210*(12*c^6*d^(3/2)*log(x) - (3*c^4*d^(3/2)*x^4 - 12*c^2*d^(3/2)*x^2 + 5*
d^(3/2))/x^6)*b*c - 1/35*b*(2*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^5) + 5*(-c^2*
d*x^2 + d)^(5/2)/(d*x^7))*arcsin(c*x) - 1/35*a*(2*(-c^2*d*x^2 + d)^(5/2)*c^
2/(d*x^5) + 5*(-c^2*d*x^2 + d)^(5/2)/(d*x^7))
```

Fricas [A]
time = 2.41, size = 599, normalized size = 2.59

$$\left[\frac{6\left(bc^{9}dx^{9}-bc^{7}dx^{7}\right)\sqrt{d}\log\left(\frac{c^{2}dx^{6}+c^{2}dx^{2}-dx^{4}-\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}\left(x^{4}-1\right)\sqrt{d}-d}{c^{2}x^{4}-x^{2}}\right)+\left(3\,bc^{5}dx^{5}-\left(3\,bc^{5}-12\,bc^{3}+5\,bc\right)dx^{7}-12\,bc^{3}dx^{3}+5\,bcdx\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}-6\left(2\,ac^{8}dx^{8}-ac^{6}dx^{6}-9\,ac^{4}dx^{4}+13\,ac^{2}dx^{2}-5\,ad+\left(2\,bc^{8}dx^{8}-bc^{6}dx^{6}-9\,bc^{4}dx^{4}+13\,bc^{2}dx^{2}-5\,bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^{2}dx^{2}+d}}{210\left(c^{2}x^{9}-x^{7}\right)},\frac{12\left(bc^{9}dx^{9}-bc^{7}dx^{7}\right)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}\left(x^{2}+1\right)\sqrt{-d}}{c^{2}dx^{4}-\left(c^{2}+1\right)dx^{2}+d}\right)+\left(3\,bc^{5}dx^{5}-\left(3\,bc^{5}-12\,bc^{3}+5\,bc\right)dx^{7}-12\,bc^{3}dx^{3}+5\,bcdx\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}-6\left(2\,ac^{8}dx^{8}-ac^{6}dx^{6}-9\,ac^{4}dx^{4}+13\,ac^{2}dx^{2}-5\,ad+\left(2\,bc^{8}dx^{8}-bc^{6}dx^{6}-9\,bc^{4}dx^{4}+13\,bc^{2}dx^{2}-5\,bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^{2}dx^{2}+d}}{210\left(c^{2}x^{9}-x^{7}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/210*(6*(b*c^9*d*x^9 - b*c^7*d*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 -
d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2
*x^4 - x^2)) + (3*b*c^5*d*x^5 - (3*b*c^5 - 12*b*c^3 + 5*b*c)*d*x^7 - 12*b*c
^3*d*x^3 + 5*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(2*a*c^8*
d*x^8 - a*c^6*d*x^6 - 9*a*c^4*d*x^4 + 13*a*c^2*d*x^2 - 5*a*d + (2*b*c^8*d*x
^8 - b*c^6*d*x^6 - 9*b*c^4*d*x^4 + 13*b*c^2*d*x^2 - 5*b*d)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d))/(c^2*x^9 - x^7), 1/210*(12*(b*c^9*d*x^9 - b*c^7*d*x^7)*s
qrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(
c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (3*b*c^5*d*x^5 - (3*b*c^5 - 12*b*c^3 +
5*b*c)*d*x^7 - 12*b*c^3*d*x^3 + 5*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x
^2 + 1) - 6*(2*a*c^8*d*x^8 - a*c^6*d*x^6 - 9*a*c^4*d*x^4 + 13*a*c^2*d*x^2 -
 5*a*d + (2*b*c^8*d*x^8 - b*c^6*d*x^6 - 9*b*c^4*d*x^4 + 13*b*c^2*d*x^2 - 5*
b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^{8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**8, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^8,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^8, x)
```

3.75 $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\mathbf{ArcSin}(cx))}{x^{10}}\,dx$

Optimal. Leaf size=308

$$-\frac{bcd\sqrt{d-c^2dx^2}}{72x^8\sqrt{1-c^2x^2}}+\frac{5bc^3d\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{420x^4\sqrt{1-c^2x^2}}-\frac{2bc^7d\sqrt{d-c^2dx^2}}{315x^2\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}}{9dx^9}$$

```
[Out] -1/9*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^9-4/63*c^2*(-c^2*d*x^2+d)^(
5/2)*(a+b*arcsin(c*x))/d/x^7-8/315*c^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x
))/d/x^5-1/72*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^8/(-c^2*x^2+1)^(1/2)+5/189*b*c^3
*d*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)-1/420*b*c^5*d*(-c^2*d*x^2+d)
^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-2/315*b*c^7*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*
x^2+1)^(1/2)+8/315*b*c^9*d*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 308, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {277, 270, 4779, 12, 1265, 907}

$$-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{9dx^9}-\frac{4c^2\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{63dx^7}-\frac{8c^4\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{315dx^5}-\frac{bcd\sqrt{d-c^2dx^2}}{72x^8\sqrt{1-c^2x^2}}+\frac{8bc^9d\log(x)\sqrt{d-c^2dx^2}}{315\sqrt{1-c^2x^2}}-\frac{2bc^7d\sqrt{d-c^2dx^2}}{315x^2\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{420x^4\sqrt{1-c^2x^2}}+\frac{5bc^3d\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -1/72*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^8*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt
[d - c^2*d*x^2])/(189*x^6*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2]
)/(420*x^4*Sqrt[1 - c^2*x^2]) - (2*b*c^7*d*Sqrt[d - c^2*d*x^2])/(315*x^2*Sq
rt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(9*d*x^9) -
(4*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (8*c^4*(d -
c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(315*d*x^5) + (8*b*c^9*d*Sqrt[d - c^2
*d*x^2]*Log[x])/(315*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{x^{10}}\,dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2\left(-35-20c^2x^2-8c^4x^4\right)}{315x^9}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(c\right.$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^2(-}{}}{315\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{4c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(c\right.}{63dx^7}$$

$$= -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{9dx^9} - \frac{4c^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(c\right.}{63dx^7}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{72x^8\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{420x^4\sqrt{1-c^2x^2}} - \frac{2bc^7}{315}$$

Mathematica [A]
time = 0.14, size = 197, normalized size = 0.64

$$-\frac{d\sqrt{d-c^2dx^2}\left(840a\left(-1+c^2x^2\right)^3\left(35+20c^2x^2+8c^4x^4\right)-bcx\sqrt{1-c^2x^2}\left(3675-7000c^2x^2+630c^4x^4+1680c^6x^6+18264c^8x^8\right)+840b\left(-1+c^2x^2\right)^3\left(35+20c^2x^2+8c^4x^4\right)\text{ArcSin}(cx)\right)}{264600x^9\left(-1+c^2x^2\right)}+\frac{8bc^9d\sqrt{d-c^2dx^2}\log(x)}{315\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -1/264600*(d*Sqrt[d - c^2*d*x^2]*(840*a*(-1 + c^2*x^2)^3*(35 + 20*c^2*x^2 +
 8*c^4*x^4) - b*c*x*Sqrt[1 - c^2*x^2]*(3675 - 7000*c^2*x^2 + 630*c^4*x^4 +
1680*c^6*x^6 + 18264*c^8*x^8) + 840*b*(-1 + c^2*x^2)^3*(35 + 20*c^2*x^2 + 8
*c^4*x^4)*ArcSin[c*x]))/(x^9*(-1 + c^2*x^2)) + (8*b*c^9*d*Sqrt[d - c^2*d*x^
2]*Log[x])/(315*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.46, size = 4563, normalized size = 14.81

method	result	size
default	Expression too large to display	4563

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x,method=_RETURNVERBOSE)
```

```
[Out] -24/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8
-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^
(1/2)*arcsin(c*x)*c^17-1104/7*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-9
45*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^4/(
```

c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^13+120*I*b*(-d*(c^2*x^2-1))^(1/
2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-472
5*c^2*x^2+1225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^11-64/3*I*
b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^
6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^12/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*c^21+208/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*
x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^6/(c^2*x^2-
1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^15+24*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840
*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2
+1225)*x^10/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^19+922/945*I*b*(-d
*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6
+6210*c^4*x^4-4725*c^2*x^2+1225)*x^11/(c^2*x^2-1)*c^20-2906/945*I*b*(-d*(c^
2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+621
0*c^4*x^4-4725*c^2*x^2+1225)*x^9/(c^2*x^2-1)*c^18-2069/189*I*b*(-d*(c^2*x^2
-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4
*x^4-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*c^16+4639/189*I*b*(-d*(c^2*x^2-1))^
(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-
4725*c^2*x^2+1225)*x^5/(c^2*x^2-1)*c^14-455/27*I*b*(-d*(c^2*x^2-1))^(1/2)*d
/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^
2*x^2+1225)*x^3/(c^2*x^2-1)*c^12+35/9*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^1
2*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+122
5)*x/(c^2*x^2-1)*c^10+a*(-1/9/d/x^9*(-c^2*d*x^2+d)^(5/2)+4/9*c^2*(-1/7/d/x^
7*(-c^2*d*x^2+d)^(5/2)-2/35*c^2/d/x^5*(-c^2*d*x^2+d)^(5/2)))+16/3*b*(-d*(c^
2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+621
0*c^4*x^4-4725*c^2*x^2+1225)*x^10/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^19-212/1
5*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*
c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^18-4*
b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^
6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^
17+3151/15*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*
x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*arcsin(c*x
)*c^16-4189/180*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189
*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^6/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)*c^15-60632/105*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*
c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^5/(c^2
*x^2-1)*arcsin(c*x)*c^14+1187/60*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-
945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^4/
(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13+59884/105*b*(-d*(c^2*x^2-1))^(1/2)*d/(8
40*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x
^2+1225)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^12+829/56*b*(-d*(c^2*x^2-1))^(1/2)*d
/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^
2*x^2+1225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-43264/63*b*(-d*(c^2*x^2
-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4
*x^4-4725*c^2*x^2+1225)*x/(c^2*x^2-1)*arcsin(c*x)*c^10+113594/63*b*(-d*(c^2
*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210

```
*c^4*x^4-4725*c^2*x^2+1225)/x/(c^2*x^2-1)*arcsin(c*x)*c^8-25915/126*b*(-d*(
c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6
210*c^4*x^4-4725*c^2*x^2+1225)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7-17452
0/63*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-27
30*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+
1285/6*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-
2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(
1/2)*c^5+19540/9*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+18
9*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^5/(c^2*x^2-1)*arcs
in(c*x)*c^4-21175/216*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^
10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^6/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*c^3-7700/9*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-94
5*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^7/(c
^2*x^2-1)*arcsin(c*x)*c^2+1225/72*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12
-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^8
/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+16*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)*arcsin(c*x)*d*c^9/(315*c^2*x^2-315)-128/315*I*b*(-d*(c^2*x^2-1))^(1
/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-...
```

Maxima [A]
time = 0.49, size = 210, normalized size = 0.68

$$\frac{1}{7560}\left(192\,c^8d^{\frac{3}{2}}\log\left(x\right)-\frac{48\,c^6d^{\frac{3}{2}}x^6+18\,c^4d^{\frac{3}{2}}x^4-200\,c^2d^{\frac{3}{2}}x^2+105\,d^{\frac{3}{2}}}{x^8}\right)bc-\frac{1}{315}\,b\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^4}{dx^5}+\frac{20\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^2}{dx^7}+\frac{35\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{dx^9}\right)\arcsin\left(cx\right)-\frac{1}{315}\,a\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^4}{dx^5}+\frac{20\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^2}{dx^7}+\frac{35\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{dx^9}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="maxima"
)
```

```
[Out] 1/7560*(192*c^8*d^(3/2)*log(x) - (48*c^6*d^(3/2)*x^6 + 18*c^4*d^(3/2)*x^4 -
 200*c^2*d^(3/2)*x^2 + 105*d^(3/2))/x^8)*b*c - 1/315*b*(8*(-c^2*d*x^2 + d)^
(5/2)*c^4/(d*x^5) + 20*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^7) + 35*(-c^2*d*x^2
+ d)^(5/2)/(d*x^9))*arcsin(c*x) - 1/315*a*(8*(-c^2*d*x^2 + d)^(5/2)*c^4/(d*
x^5) + 20*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^7) + 35*(-c^2*d*x^2 + d)^(5/2)/(d
*x^9))
```

Fricas [A]
time = 2.53, size = 671, normalized size = 2.18

$$\left[\frac{96\left(bc^{11}dx^{11}-bc^9dx^9\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^4-1\right)\sqrt{d}-d}{c^2x^4-x^2}\right)+\left(48\,bc^7dx^7+18\,bc^5dx^5-\left(48\,bc^7+18\,bc^5-200\,bc^3+105\,bc\right)dx^9-200\,bc^3dx^3+105\,bcdx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}-24\left(8\,ac^{10}dx^{10}-4\,ac^8dx^8-ac^6dx^6-53\,ac^4dx^4+85\,ac^2dx^2-35\,ad+\left(8\,bc^{10}dx^{10}-4\,bc^8dx^8-bc^6dx^6-53\,bc^4dx^4+85\,bc^2dx^2-35\,bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{7560\left(c^2x^{11}-x^9\right)},\ \frac{192\left(bc^{11}dx^{11}-bc^9dx^9\right)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\left(x^2+1\right)\sqrt{-d}}{c^2dx^4-\left(c^2+1\right)dx^2+d}\right)+\left(48\,bc^7dx^7+18\,bc^5dx^5-\left(48\,bc^7+18\,bc^5-200\,bc^3+105\,bc\right)dx^9-200\,bc^3dx^3+105\,bcdx\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}-24\left(8\,ac^{10}dx^{10}-4\,ac^8dx^8-ac^6dx^6-53\,ac^4dx^4+85\,ac^2dx^2-35\,ad+\left(8\,bc^{10}dx^{10}-4\,bc^8dx^8-bc^6dx^6-53\,bc^4dx^4+85\,bc^2dx^2-35\,bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{7560\left(c^2x^{11}-x^9\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="fricas"
)
```

```
[Out] [1/7560*(96*(b*c^11*d*x^11 - b*c^9*d*x^9)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^
2 - d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/
```

```
(c^2*x^4 - x^2)) + (48*b*c^7*d*x^7 + 18*b*c^5*d*x^5 - (48*b*c^7 + 18*b*c^5
- 200*b*c^3 + 105*b*c)*d*x^9 - 200*b*c^3*d*x^3 + 105*b*c*d*x)*sqrt(-c^2*d*x
^2 + d)*sqrt(-c^2*x^2 + 1) - 24*(8*a*c^10*d*x^10 - 4*a*c^8*d*x^8 - a*c^6*d*
x^6 - 53*a*c^4*d*x^4 + 85*a*c^2*d*x^2 - 35*a*d + (8*b*c^10*d*x^10 - 4*b*c^8
*d*x^8 - b*c^6*d*x^6 - 53*b*c^4*d*x^4 + 85*b*c^2*d*x^2 - 35*b*d)*arcsin(c*x
))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9), 1/7560*(192*(b*c^11*d*x^11 - b*c
^9*d*x^9)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)
*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (48*b*c^7*d*x^7 + 18*b*c^5*d
*x^5 - (48*b*c^7 + 18*b*c^5 - 200*b*c^3 + 105*b*c)*d*x^9 - 200*b*c^3*d*x^3
+ 105*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 24*(8*a*c^10*d*x^1
0 - 4*a*c^8*d*x^8 - a*c^6*d*x^6 - 53*a*c^4*d*x^4 + 85*a*c^2*d*x^2 - 35*a*d
+ (8*b*c^10*d*x^10 - 4*b*c^8*d*x^8 - b*c^6*d*x^6 - 53*b*c^4*d*x^4 + 85*b*c^
2*d*x^2 - 35*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)]
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**10,x)
```

```
[Out] Timed out
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^10,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^10, x)
```

3.76 $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\textbf{ArcSin}(cx))}{x^{12}}\,dx$

Optimal. Leaf size=385

$$-\frac{bcd\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{66x^8\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{1386x^6\sqrt{1-c^2x^2}}-\frac{bc^7d\sqrt{d-c^2dx^2}}{770x^4\sqrt{1-c^2x^2}}-\frac{4bc^9d\sqrt{d-c^2dx^2}}{1155x^2\sqrt{1-c^2x^2}}-(d-c$$

```
[Out] -1/11*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^11-2/33*c^2*(-c^2*d*x^2+d)
^(5/2)*(a+b*arcsin(c*x))/d/x^9-8/231*c^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c
*x))/d/x^7-16/1155*c^6*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^5-1/110*b
*c*d*(-c^2*d*x^2+d)^(1/2)/x^10/(-c^2*x^2+1)^(1/2)+1/66*b*c^3*d*(-c^2*d*x^2+
d)^(1/2)/x^8/(-c^2*x^2+1)^(1/2)-1/1386*b*c^5*d*(-c^2*d*x^2+d)^(1/2)/x^6/(-c
^2*x^2+1)^(1/2)-1/770*b*c^7*d*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-4
/1155*b*c^9*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)+16/1155*b*c^11*d*
ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.19, antiderivative size = 385, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {277, 270, 4779, 12, 1813, 1634}

$$-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{11dx^{11}}-\frac{2c^2\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{33dx^9}-\frac{16c^6\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{1155dx^5}-\frac{8c^4\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{231dx^7}-\frac{bcd\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}}+\frac{16bc^{11}d\log(x)\sqrt{d-c^2dx^2}}{1155\sqrt{1-c^2x^2}}-\frac{4bc^9d\sqrt{d-c^2dx^2}}{1155x^2\sqrt{1-c^2x^2}}-\frac{bc^7d\sqrt{d-c^2dx^2}}{770x^4\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{1386x^6\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{66x^8\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] -1/110*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^10*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt
[d - c^2*d*x^2])/(66*x^8*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])
/(1386*x^6*Sqrt[1 - c^2*x^2]) - (b*c^7*d*Sqrt[d - c^2*d*x^2])/(770*x^4*Sqrt
[1 - c^2*x^2]) - (4*b*c^9*d*Sqrt[d - c^2*d*x^2])/(1155*x^2*Sqrt[1 - c^2*x^2
]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(11*d*x^11) - (2*c^2*(d -
c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(33*d*x^9) - (8*c^4*(d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x]))/(231*d*x^7) - (16*c^6*(d - c^2*d*x^2)^(5/2)*(a +
b*ArcSin[c*x]))/(1155*d*x^5) + (16*b*c^11*d*Sqrt[d - c^2*d*x^2]*Log[x])/(11
55*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
```

```
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{x^{12}}\,dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)^2(-105-70c^2x^2-40c^4x^4-16c^6x^6)}{1155x^{11}}\,dx}{\sqrt{1-c^2x^2}} + (a+b$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{11dx^{11}} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)^2(-}{}}{1155\sqrt{1-}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{11dx^{11}} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(c}{33dx^9}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{11dx^{11}} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(c}{33dx^9}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} + \frac{bc^3d\sqrt{d-c^2dx^2}}{66x^8\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{1386x^6\sqrt{1-c^2x^2}} - \frac{bc}{77}$$

Mathematica [A]
time = 0.15, size = 221, normalized size = 0.57

$$-\frac{d\sqrt{d-c^2dx^2}\left(630a(-1+c^2x^2)^3(105+70c^2x^2+40c^4x^4+16c^6x^6)-bcx\sqrt{1-c^2x^2}(6615-11025c^2x^2+525c^4x^4+945c^6x^6+2520c^8x^8+29524c^{10}x^{10})+630b(-1+c^2x^2)^3(105+70c^2x^2+40c^4x^4+16c^6x^6)\,\mathrm{ArcSin}(cx)\right)}{727650x^{11}(-1+c^2x^2)} + \frac{16bc^{11}d\sqrt{d-c^2dx^2}\log(x)}{1155\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] -1/727650*(d*Sqrt[d - c^2*d*x^2]*(630*a*(-1 + c^2*x^2)^3*(105 + 70*c^2*x^2
+ 40*c^4*x^4 + 16*c^6*x^6) - b*c*x*Sqrt[1 - c^2*x^2]*(6615 - 11025*c^2*x^2
+ 525*c^4*x^4 + 945*c^6*x^6 + 2520*c^8*x^8 + 29524*c^10*x^10) + 630*b*(-1 +
 c^2*x^2)^3*(105 + 70*c^2*x^2 + 40*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]))/(x^1
1*(-1 + c^2*x^2)) + (16*b*c^11*d*Sqrt[d - c^2*d*x^2]*Log[x])/(1155*Sqrt[1 -
 c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.56, size = 5886, normalized size = 15.29

method	result	size
default	Expression too large to display	5886

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Maxima [A]

time = 0.51, size = 269, normalized size = 0.70

$$\frac{1}{6930}\left(96\,c^{10}d^{\frac{3}{2}}\log\left(x\right)-\frac{24\,c^{8}d^{\frac{3}{2}}x^{8}+9\,c^{6}d^{\frac{3}{2}}x^{6}+5\,c^{4}d^{\frac{3}{2}}x^{4}-105\,c^{2}d^{\frac{3}{2}}x^{2}+63\,d^{\frac{3}{2}}}{x^{10}}\right)bc-\frac{1}{1155}\left(\frac{16\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{6}}{dx^{5}}+\frac{40\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{4}}{dx^{7}}+\frac{70\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{2}}{dx^{9}}+\frac{105\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}}{dx^{11}}\right)b\arcsin\left(cx\right)-\frac{1}{1155}\left(\frac{16\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{6}}{dx^{5}}+\frac{40\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{4}}{dx^{7}}+\frac{70\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}c^{2}}{dx^{9}}+\frac{105\left(-c^{2}dx^{2}+d\right)^{\frac{5}{2}}}{dx^{11}}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="maxima"
)
```

```
[Out] 1/6930*(96*c^10*d^(3/2)*log(x) - (24*c^8*d^(3/2)*x^8 + 9*c^6*d^(3/2)*x^6 +
5*c^4*d^(3/2)*x^4 - 105*c^2*d^(3/2)*x^2 + 63*d^(3/2))/x^10)*b*c - 1/1155*(1
6*(-c^2*d*x^2 + d)^(5/2)*c^6/(d*x^5) + 40*(-c^2*d*x^2 + d)^(5/2)*c^4/(d*x^7
) + 70*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^9) + 105*(-c^2*d*x^2 + d)^(5/2)/(d*x
^11))*b*arcsin(c*x) - 1/1155*(16*(-c^2*d*x^2 + d)^(5/2)*c^6/(d*x^5) + 40*(-
c^2*d*x^2 + d)^(5/2)*c^4/(d*x^7) + 70*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^9) +
105*(-c^2*d*x^2 + d)^(5/2)/(d*x^11))*a
```

Fricas [A]

time = 3.30, size = 743, normalized size = 1.93

$$\left[\frac{48\left(bc^{13}dx^{13}-bc^{11}dx^{11}\right)\sqrt{d}\log\left(\frac{c^{2}dx^{6}+c^{2}dx^{2}-dx^{4}-\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}\left(x^{4}-1\right)\sqrt{d}-d}{c^{2}x^{4}-x^{2}}\right)+\left(24\,bc^{9}dx^{9}+9\,bc^{7}dx^{7}-\left(24\,bc^{9}+9\,bc^{7}+5\,bc^{5}-105\,bc^{3}+63\,bc\right)dx^{11}+5\,bc^{5}dx^{5}-105\,bc^{3}dx^{3}+63\,bcdx\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}-6\left(16\,ac^{12}dx^{12}-8\,ac^{10}dx^{10}-2\,ac^{8}dx^{8}-ac^{6}dx^{6}-145\,ac^{4}dx^{4}+245\,ac^{2}dx^{2}-105\,ad+\left(16\,bc^{12}dx^{12}-8\,bc^{10}dx^{10}-2\,bc^{8}dx^{8}-bc^{6}dx^{6}-145\,bc^{4}dx^{4}+245\,bc^{2}dx^{2}-105\,bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^{2}dx^{2}+d}}{6930\left(c^{2}x^{13}-x^{11}\right)},\frac{96\left(bc^{13}dx^{13}-bc^{11}dx^{11}\right)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}\left(x^{2}+1\right)\sqrt{-d}}{c^{2}dx^{4}-\left(c^{2}+1\right)dx^{2}+d}\right)+\left(24\,bc^{9}dx^{9}+9\,bc^{7}dx^{7}-\left(24\,bc^{9}+9\,bc^{7}+5\,bc^{5}-105\,bc^{3}+63\,bc\right)dx^{11}+5\,bc^{5}dx^{5}-105\,bc^{3}dx^{3}+63\,bcdx\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}-6\left(16\,ac^{12}dx^{12}-8\,ac^{10}dx^{10}-2\,ac^{8}dx^{8}-ac^{6}dx^{6}-145\,ac^{4}dx^{4}+245\,ac^{2}dx^{2}-105\,ad+\left(16\,bc^{12}dx^{12}-8\,bc^{10}dx^{10}-2\,bc^{8}dx^{8}-bc^{6}dx^{6}-145\,bc^{4}dx^{4}+245\,bc^{2}dx^{2}-105\,bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^{2}dx^{2}+d}}{6930\left(c^{2}x^{13}-x^{11}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="fricas"
)
```

```
[Out] [1/6930*(48*(b*c^13*d*x^13 - b*c^11*d*x^11)*sqrt(d)*log((c^2*d*x^6 + c^2*d*
x^2 - d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d
)/(c^2*x^4 - x^2)) + (24*b*c^9*d*x^9 + 9*b*c^7*d*x^7 - (24*b*c^9 + 9*b*c^7
+ 5*b*c^5 - 105*b*c^3 + 63*b*c)*d*x^11 + 5*b*c^5*d*x^5 - 105*b*c^3*d*x^3 +
63*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(16*a*c^12*d*x^12 -
 8*a*c^10*d*x^10 - 2*a*c^8*d*x^8 - a*c^6*d*x^6 - 145*a*c^4*d*x^4 + 245*a*c^
2*d*x^2 - 105*a*d + (16*b*c^12*d*x^12 - 8*b*c^10*d*x^10 - 2*b*c^8*d*x^8 - b
*c^6*d*x^6 - 145*b*c^4*d*x^4 + 245*b*c^2*d*x^2 - 105*b*d)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d))/(c^2*x^13 - x^11), 1/6930*(96*(b*c^13*d*x^13 - b*c^11*d*x
^11)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt
(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (24*b*c^9*d*x^9 + 9*b*c^7*d*x^7 -
 (24*b*c^9 + 9*b*c^7 + 5*b*c^5 - 105*b*c^3 + 63*b*c)*d*x^11 + 5*b*c^5*d*x^5
 - 105*b*c^3*d*x^3 + 63*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) -
6*(16*a*c^12*d*x^12 - 8*a*c^10*d*x^10 - 2*a*c^8*d*x^8 - a*c^6*d*x^6 - 145*a
*c^4*d*x^4 + 245*a*c^2*d*x^2 - 105*a*d + (16*b*c^12*d*x^12 - 8*b*c^10*d*x^1
0 - 2*b*c^8*d*x^8 - b*c^6*d*x^6 - 145*b*c^4*d*x^4 + 245*b*c^2*d*x^2 - 105*b
*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^13 - x^11)]
```

Sympy [F(-2)]

time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**12,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3877 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^12,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^12, x)
```

3.77 $\int x^7(d-c^2dx^2)^{3/2}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=375

$$\frac{16bdx\sqrt{d-c^2dx^2}}{1155c^7\sqrt{1-c^2x^2}}+\frac{8bdx^3\sqrt{d-c^2dx^2}}{3465c^5\sqrt{1-c^2x^2}}+\frac{2bdx^5\sqrt{d-c^2dx^2}}{1925c^3\sqrt{1-c^2x^2}}+\frac{bdx^7\sqrt{d-c^2dx^2}}{1617c\sqrt{1-c^2x^2}}-\frac{4bcdx^9\sqrt{d-c^2dx^2}}{297\sqrt{1-c^2x^2}}+\frac{bc^3 d}{1}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^8/d+3/7*(-c^2*d*x^2+d)^(7/2)*
(a+b*arcsin(c*x))/c^8/d^2-1/3*(-c^2*d*x^2+d)^(9/2)*(a+b*arcsin(c*x))/c^8/d^
3+1/11*(-c^2*d*x^2+d)^(11/2)*(a+b*arcsin(c*x))/c^8/d^4+16/1155*b*d*x*(-c^2*
d*x^2+d)^(1/2)/c^7/(-c^2*x^2+1)^(1/2)+8/3465*b*d*x^3*(-c^2*d*x^2+d)^(1/2)/c
^5/(-c^2*x^2+1)^(1/2)+2/1925*b*d*x^5*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^
(1/2)+1/1617*b*d*x^7*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/297*b*c*d*
x^9*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/121*b*c^3*d*x^11*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.17, antiderivative size = 375, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {272, 45, 4779, 12, 1824}

$$\frac{(d-c^2dx^2)^{11/2}(a+b\text{ArcSin}(cx))}{11c^8d^4}-\frac{(d-c^2dx^2)^{9/2}(a+b\text{ArcSin}(cx))}{3c^8d^3}+\frac{3(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{7c^8d^2}-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))}{5c^8d}-\frac{4bcdx^9\sqrt{d-c^2dx^2}}{297\sqrt{1-c^2x^2}}+\frac{bdx^7\sqrt{d-c^2dx^2}}{1617c\sqrt{1-c^2x^2}}+\frac{16bdx\sqrt{d-c^2dx^2}}{1155c^7\sqrt{1-c^2x^2}}+\frac{8bdx^3\sqrt{d-c^2dx^2}}{3465c^5\sqrt{1-c^2x^2}}+\frac{bc^3dx^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}}+\frac{2bdx^5\sqrt{d-c^2dx^2}}{1925c^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^7*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d*x*Sqrt[d - c^2*d*x^2])/(1155*c^7*Sqrt[1 - c^2*x^2]) + (8*b*d*x^3*Sq
rt[d - c^2*d*x^2])/(3465*c^5*Sqrt[1 - c^2*x^2]) + (2*b*d*x^5*Sqrt[d - c^2*d
*x^2])/(1925*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^7*Sqrt[d - c^2*d*x^2])/(1617*c
*Sqrt[1 - c^2*x^2]) - (4*b*c*d*x^9*Sqrt[d - c^2*d*x^2])/(297*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^2]) - ((d - c
^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^8*d) + (3*(d - c^2*d*x^2)^(7/2)*(
a + b*ArcSin[c*x]))/(7*c^8*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcSin[c*x]
))/(3*c^8*d^3) + ((d - c^2*d*x^2)^(11/2)*(a + b*ArcSin[c*x]))/(11*c^8*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1824

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int x^7\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx = -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^2\left(-16-40c^2x^2-70c^4x^4-105c^6x^6\right)}{1155c^8}\,dx}{\sqrt{1-c^2x^2}}+(a$$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^2\left(-16-40c^2x^2-70c^4x^4-105c$$

$$1155c^7\sqrt{1-c^2x^2}$$

$$= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(-16-8c^2x^2-6c^4x^4-5c^6x^6+140c^8x^8-\right.$$

$$1155c^7\sqrt{1-c^2x^2}$$

$$= \frac{16bdx\sqrt{d-c^2dx^2}}{1155c^7\sqrt{1-c^2x^2}}+\frac{8bdx^3\sqrt{d-c^2dx^2}}{3465c^5\sqrt{1-c^2x^2}}+\frac{2bdx^5\sqrt{d-c^2dx^2}}{1925c^3\sqrt{1-c^2x^2}}+$$

Mathematica [A]
time = 0.12, size = 174, normalized size = 0.46

$$\frac{d\sqrt{d-c^2dx^2}\left(-3465a\left(1-c^2x^2\right)^{5/2}\left(16+40c^2x^2+70c^4x^4+105c^6x^6\right)+bcx\left(55440+9240c^2x^2+4158c^4x^4+2475c^6x^6-53900c^8x^8+33075c^{10}x^{10}\right)-3465b\left(1-c^2x^2\right)^{5/2}\left(16+40c^2x^2+70c^4x^4+105c^6x^6\right)\text{ArcSin}(cx)\right)}{4002075c^8\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-3465*a*(1 - c^2*x^2)^(5/2)*(16 + 40*c^2*x^2 + 70*c
^4*x^4 + 105*c^6*x^6) + b*c*x*(55440 + 9240*c^2*x^2 + 4158*c^4*x^4 + 2475*c
^6*x^6 - 53900*c^8*x^8 + 33075*c^10*x^10) - 3465*b*(1 - c^2*x^2)^(5/2)*(16
+ 40*c^2*x^2 + 70*c^4*x^4 + 105*c^6*x^6)*ArcSin[c*x]))/(4002075*c^8*Sqrt[1
- c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.54, size = 1781, normalized size = 4.75

method	result	size
default	Expression too large to display	1781

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/11*x^6*(-c^2*d*x^2+d)^(5/2)/c^2/d+6/11/c^2*(-1/9*x^4*(-c^2*d*x^2+d)^(
5/2)/c^2/d+4/9/c^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*
x^2+d)^(5/2))))+b*(-1/247808*(-d*(c^2*x^2-1))^(1/2)*(1+1232*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5-2816*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-3328*c^10*x^10-1024*I*(-c^2
*x^2+1)^(1/2)*x^11*c^11+1024*c^12*x^12-220*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-235
2*c^6*x^6+4096*c^8*x^8-61*c^2*x^2+2816*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+11*I*(-
c^2*x^2+1)^(1/2)*x*c+620*c^4*x^4)*(I+11*arcsin(c*x))*d/c^8/(c^2*x^2-1)-1/55
296*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1
/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/100352*(-d*
(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+
104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^8/(c^2*x^2
-1)+11/51200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1
)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)
^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/3072*(-d*(c^2*x^2-1))^(
1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(
1/2)*x*c+1)*(I+3*arcsin(c*x))*d/c^8/(c^2*x^2-1)-7/1024*(-d*(c^2*x^2-1))^(1/
2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^8/(c^2*x^2-1)-7
/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c
*x)-I)*d/c^8/(c^2*x^2-1)+1/3072*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1
/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(
c*x))*d/c^8/(c^2*x^2-1)+11/51200*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c
^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/10
0352*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112
*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+1
04*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/c^
```

```
8/(c^2*x^2-1)-1/55296*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*
c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x
^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d/c^8/(c^2*x
^2-1)-1/247808*(-d*(c^2*x^2-1))^(1/2)*(1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+
1024*c^12*x^12-2816*I*(-c^2*x^2+1)^(1/2)*x^9*c^9-3328*c^10*x^10+2816*I*(-c^
2*x^2+1)^(1/2)*x^7*c^7+4096*c^8*x^8-1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2352*
c^6*x^6+220*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+620*c^4*x^4-11*I*(-c^2*x^2+1)^(1/2
)*x*c-61*c^2*x^2+1)*(-I+11*arcsin(c*x))*d/c^8/(c^2*x^2-1))
```

Maxima [A]
time = 0.50, size = 267, normalized size = 0.71

$$-\frac{1}{1155}\left(\frac{105\,(-c^2dx^2+d)^{\frac{5}{2}}x^6}{c^2d}+\frac{70\,(-c^2dx^2+d)^{\frac{5}{2}}x^4}{c^4d}+\frac{40\,(-c^2dx^2+d)^{\frac{5}{2}}x^2}{c^6d}+\frac{16\,(-c^2dx^2+d)^{\frac{5}{2}}}{c^8d}\right)b\arcsin(cx)-\frac{1}{1155}\left(\frac{105\,(-c^2dx^2+d)^{\frac{5}{2}}x^6}{c^2d}+\frac{70\,(-c^2dx^2+d)^{\frac{5}{2}}x^4}{c^4d}+\frac{40\,(-c^2dx^2+d)^{\frac{5}{2}}x^2}{c^6d}+\frac{16\,(-c^2dx^2+d)^{\frac{5}{2}}}{c^8d}\right)a+\frac{\left(33075\,c^{10}d^{\frac{3}{2}}x^{11}-53900\,c^8d^{\frac{3}{2}}x^9+2475\,c^6d^{\frac{3}{2}}x^7+4158\,c^4d^{\frac{3}{2}}x^5+9240\,c^2d^{\frac{3}{2}}x^3+55440\,d^{\frac{3}{2}}x\right)b}{4002075\,c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/1155*(105*(-c^2*d*x^2 + d)^(5/2)*x^6/(c^2*d) + 70*(-c^2*d*x^2 + d)^(5/2)
*x^4/(c^4*d) + 40*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^6*d) + 16*(-c^2*d*x^2 + d)^
(5/2)/(c^8*d))*b*arcsin(c*x) - 1/1155*(105*(-c^2*d*x^2 + d)^(5/2)*x^6/(c^2*
d) + 70*(-c^2*d*x^2 + d)^(5/2)*x^4/(c^4*d) + 40*(-c^2*d*x^2 + d)^(5/2)*x^2/
(c^6*d) + 16*(-c^2*d*x^2 + d)^(5/2)/(c^8*d))*a + 1/4002075*(33075*c^10*d^(3
/2)*x^11 - 53900*c^8*d^(3/2)*x^9 + 2475*c^6*d^(3/2)*x^7 + 4158*c^4*d^(3/2)*
x^5 + 9240*c^2*d^(3/2)*x^3 + 55440*d^(3/2)*x)*b/c^7
```

Fricas [A]
time = 2.90, size = 249, normalized size = 0.66

$$-\frac{(33075\,bc^{11}dx^{11}-53900\,bc^9dx^9+2475\,bc^7dx^7+4158\,bc^5dx^5+9240\,bc^3dx^3+55440\,bcdx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+3465\,(105\,ac^{12}dx^{12}-245\,ac^{10}dx^{10}+145\,ac^8dx^8+ac^6dx^6+2\,ac^4dx^4+8\,ac^2dx^2-16\,ad+(105\,bc^{12}dx^{12}-245\,bc^{10}dx^{10}+145\,bc^8dx^8+bc^6dx^6+2\,bc^4dx^4+8\,bc^2dx^2-16\,bd)\arcsin(cx))\sqrt{-c^2dx^2+d}}{4002075\,(c^{10}x^2-c^8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/4002075*((33075*b*c^11*d*x^11 - 53900*b*c^9*d*x^9 + 2475*b*c^7*d*x^7 + 4
158*b*c^5*d*x^5 + 9240*b*c^3*d*x^3 + 55440*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sq
rt(-c^2*x^2 + 1) + 3465*(105*a*c^12*d*x^12 - 245*a*c^10*d*x^10 + 145*a*c^8*
d*x^8 + a*c^6*d*x^6 + 2*a*c^4*d*x^4 + 8*a*c^2*d*x^2 - 16*a*d + (105*b*c^12*
d*x^12 - 245*b*c^10*d*x^10 + 145*b*c^8*d*x^8 + b*c^6*d*x^6 + 2*b*c^4*d*x^4
+ 8*b*c^2*d*x^2 - 16*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^10*x^2 - c^
8)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3060 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^7\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x^7*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.78 $\int x^5(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=301

$$\frac{8bdx\sqrt{d-c^2dx^2}}{315c^5\sqrt{1-c^2x^2}}+\frac{4bdx^3\sqrt{d-c^2dx^2}}{945c^3\sqrt{1-c^2x^2}}+\frac{bdx^5\sqrt{d-c^2dx^2}}{525c\sqrt{1-c^2x^2}}-\frac{10bcdx^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}+\frac{bc^3dx^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}-\frac{(d-$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^6/d+2/7*(-c^2*d*x^2+d)^(7/2)*
(a+b*arcsin(c*x))/c^6/d^2-1/9*(-c^2*d*x^2+d)^(9/2)*(a+b*arcsin(c*x))/c^6/d^
3+8/315*b*d*x*(-c^2*d*x^2+d)^(1/2)/c^5/(-c^2*x^2+1)^(1/2)+4/945*b*d*x^3*(-c
^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/525*b*d*x^5*(-c^2*d*x^2+d)^(1/2)
/c/(-c^2*x^2+1)^(1/2)-10/441*b*c*d*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)+1/81*b*c^3*d*x^9*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {272, 45, 4779, 12, 1167}

$$-\frac{(d-c^2dx^2)^{9/2}(a+b\text{ArcSin}(cx))}{9c^6d^3}+\frac{2(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{7c^6d^2}-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))}{5c^6d}-\frac{10bcdx^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}+\frac{bdx^5\sqrt{d-c^2dx^2}}{525c\sqrt{1-c^2x^2}}+\frac{8bdx\sqrt{d-c^2dx^2}}{315c^5\sqrt{1-c^2x^2}}+\frac{bc^3dx^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}+\frac{4bdx^3\sqrt{d-c^2dx^2}}{945c^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d*x*Sqrt[d - c^2*d*x^2])/(315*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d*x^3*Sqrt
[d - c^2*d*x^2])/(945*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^5*Sqrt[d - c^2*d*x^2]
)/(525*c*Sqrt[1 - c^2*x^2]) - (10*b*c*d*x^7*Sqrt[d - c^2*d*x^2])/(441*Sqrt[
1 - c^2*x^2]) + (b*c^3*d*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^2]) -
((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d) + (2*(d - c^2*d*x^2)^
(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcS
in[c*x]))/(9*c^6*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}\int x^5\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx &= -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^2\left(-8-20c^2x^2-35c^4x^4\right)}{315c^6}\,dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin\right.\\ &= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^2\left(-8-20c^2x^2-35c^4x^4\right)\,dx}{315c^5\sqrt{1-c^2x^2}}+\\ &= -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(-8-4c^2x^2-3c^4x^4+50c^6x^6-35c^8x^8\right)}{315c^5\sqrt{1-c^2x^2}}\\ &= \frac{8bdx\sqrt{d-c^2dx^2}}{315c^5\sqrt{1-c^2x^2}}+\frac{4bdx^3\sqrt{d-c^2dx^2}}{945c^3\sqrt{1-c^2x^2}}+\frac{bdx^5\sqrt{d-c^2dx^2}}{525c\sqrt{1-c^2x^2}}-\end{aligned}$$

Mathematica [A]

time = 0.11, size = 150, normalized size = 0.50

$$\frac{d\sqrt{d-c^2dx^2}\left(-315a\left(1-c^2x^2\right)^{5/2}\left(8+20c^2x^2+35c^4x^4\right)+bcx\left(2520+420c^2x^2+189c^4x^4-2250c^6x^6+1225c^8x^8\right)-315b\left(1-c^2x^2\right)^{5/2}\left(8+20c^2x^2+35c^4x^4\right)\mathrm{ArcSin}(cx)\right)}{99225c^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

[Out] (d*Sqrt[d - c^2*d*x^2]*(-315*a*(1 - c^2*x^2)^(5/2)*(8 + 20*c^2*x^2 + 35*c^4
*x^4) + b*c*x*(2520 + 420*c^2*x^2 + 189*c^4*x^4 - 2250*c^6*x^6 + 1225*c^8*x
^8) - 315*b*(1 - c^2*x^2)^(5/2)*(8 + 20*c^2*x^2 + 35*c^4*x^4)*ArcSin[c*x]))
/(99225*c^6*Sqrt[1 - c^2*x^2])

Maple [C] Result contains complex when optimal does not.
time = 0.37, size = 1254, normalized size = 4.17

method	result
default	$a\left(-\frac{x^4\left(-c^2 d\,x^2+d\right)^{\frac{5}{2}}}{9c^2 d}+\frac{-\frac{4x^2\left(-c^2 d\,x^2+d\right)^{\frac{5}{2}}}{63c^2 d}-\frac{8\left(-c^2 d\,x^2+d\right)^{\frac{5}{2}}}{315d\,c^4}}{c^2}\right)+b\left(-\frac{\sqrt{-d\left(c^2x^2-1\right)}\,\left(256c^{10}x^{10}-704c^8x^8-256i\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(-1/9*x^4*(-c^2*d*x^2+d)^(5/2)/c^2/d+4/9/c^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/
2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2)))+b*(-1/41472*(-d*(c^2*x^2-1))^(1/
2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+
576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c
^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1
)*(I+9*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^
8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x
^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^
2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^6/(c^2*x^2-1)+1/3200*(-d*(c^2*x^2-1
))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+
20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c
*x))*d/c^6/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)
^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^6/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2
)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^6/(c^2*x^2-1)+1/
1152*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(
-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/2
5088*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112
I(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+1
04*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/c^
6/(c^2*x^2-1)-1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*
c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x
^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d/c^6/(c^2*x
^2-1)-1/14400*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(
17*I+15*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/3600*(-d*(c^2*x
^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(2*I+15*arcsin(c*x))*sin(
4*arcsin(c*x))*d/c^6/(c^2*x^2-1))

Maxima [A]

time = 0.49, size = 208, normalized size = 0.69

$$-\frac{1}{315}\left(\frac{35\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}{c^2d}+\frac{20\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^6d}\right)b\arcsin\left(cx\right)-\frac{1}{315}\left(\frac{35\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}{c^2d}+\frac{20\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^6d}\right)a+\frac{\left(1225\,c^8d^{\frac{3}{2}}x^9-2250\,c^6d^{\frac{3}{2}}x^7+189\,c^4d^{\frac{3}{2}}x^5+420\,c^2d^{\frac{3}{2}}x^3+2520\,d^{\frac{3}{2}}x\right)b}{99225\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/315*(35*(-c^2*d*x^2 + d)^(5/2)*x^4/(c^2*d) + 20*(-c^2*d*x^2 + d)^(5/2)*x
^2/(c^4*d) + 8*(-c^2*d*x^2 + d)^(5/2)/(c^6*d))*b*arcsin(c*x) - 1/315*(35*(-
c^2*d*x^2 + d)^(5/2)*x^4/(c^2*d) + 20*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^4*d) +
8*(-c^2*d*x^2 + d)^(5/2)/(c^6*d))*a + 1/99225*(1225*c^8*d^(3/2)*x^9 - 2250*
c^6*d^(3/2)*x^7 + 189*c^4*d^(3/2)*x^5 + 420*c^2*d^(3/2)*x^3 + 2520*d^(3/2)*
x)*b/c^5
```

Fricas [A]
time = 4.25, size = 219, normalized size = 0.73

$$-\frac{\left(1225\,bc^9dx^9-2250\,bc^7dx^7+189\,bc^5dx^5+420\,bc^3dx^3+2520\,bcdx\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+315\left(35\,ac^{10}dx^{10}-85\,ac^8dx^8+53\,ac^6dx^6+ac^4dx^4+4\,ac^2dx^2-8\,ad+\left(35\,bc^{10}dx^{10}-85\,bc^8dx^8+53\,bc^6dx^6+bc^4dx^4+4\,bc^2dx^2-8\,bd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{99225\left(c^8x^2-c^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/99225*((1225*b*c^9*d*x^9 - 2250*b*c^7*d*x^7 + 189*b*c^5*d*x^5 + 420*b*c^
3*d*x^3 + 2520*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 315*(35*a
*c^10*d*x^10 - 85*a*c^8*d*x^8 + 53*a*c^6*d*x^6 + a*c^4*d*x^4 + 4*a*c^2*d*x^
2 - 8*a*d + (35*b*c^10*d*x^10 - 85*b*c^8*d*x^8 + 53*b*c^6*d*x^6 + b*c^4*d*x
^4 + 4*b*c^2*d*x^2 - 8*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c
^6)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^5\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.79 $\int x^3(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=227

$$\frac{2bdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{bdx^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}}-\frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+\frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\mathrm{ArcS}}{5c^4d}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^4/d+1/7*(-c^2*d*x^2+d)^(7/2)*
(a+b*arcsin(c*x))/c^4/d^2+2/35*b*d*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^
(1/2)+1/105*b*d*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-8/175*b*c*d*x
^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/49*b*c^3*d*x^7*(-c^2*d*x^2+d)^
(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {272, 45, 4779, 12, 380}

$$\frac{(d-c^2dx^2)^{7/2}(a+b\mathrm{ArcSin}(cx))}{7c^4d^2}-\frac{(d-c^2dx^2)^{5/2}(a+b\mathrm{ArcSin}(cx))}{5c^4d}-\frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+\frac{bdx^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*x*Sqrt[d - c^2*d*x^2])/(35*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^3*Sqrt[d
- c^2*d*x^2])/(105*c*Sqrt[1 - c^2*x^2]) - (8*b*c*d*x^5*Sqrt[d - c^2*d*x^2])
/(175*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c
^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d) + ((d - c^
2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{\left(-2-5c^2x^2\right)\left(1-c^2x^2\right)^2}{35c^4}\,dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx)\right)$$

$$=-\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(-2-5c^2x^2\right)\left(1-c^2x^2\right)^2\,dx}{35c^3\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+b\sin\right.$$

$$=-\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+8c^4x^4-5c^6x^6\right)\,dx}{35c^3\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+b\right.$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{bdx^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}}-\frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+$$

Mathematica [A]
time = 0.09, size = 126, normalized size = 0.56

$$\frac{d\sqrt{d-c^2dx^2}\left(-105a(1-c^2x^2)^{5/2}(2+5c^2x^2)+bcx(210+35c^2x^2-168c^4x^4+75c^6x^6)-105b(1-c^2x^2)^{5/2}(2+5c^2x^2)\,\text{ArcSin}(cx)\right)}{3675c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-105*a*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + b*c*x*
(210 + 35*c^2*x^2 - 168*c^4*x^4 + 75*c^6*x^6) - 105*b*(1 - c^2*x^2)^(5/2)*(
2 + 5*c^2*x^2)*ArcSin[c*x]))/(3675*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.20, size = 727, normalized size = 3.20

method	result
default	$a\left(-\frac{x^{2}\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{7c^{2} d}-\frac{2\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{35 d\,c^{4}}\right)+b\left(-\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(64 c^{8} x^{8}-144 c^{6} x^{6}-64 i\sqrt{-c^{2} x^{2}+1}\,x^{7} c^{7}+\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+b*(
-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1
/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/
c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*
x*c-1)*(arcsin(c*x)+I)*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-
c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^4/(c^2*x^2-1)+1/384*(-d
*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2
+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^4/(c^2*x^2-1)+3/39200*(-d
*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(2*I+35*arcsin(c*x
))*cos(6*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/78400*(-d*(c^2*x^2-1))^(1/2)*(I*x
^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(37*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d
/c^4/(c^2*x^2-1)-1/2400*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^
2*x^2-1)*(7*I+15*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/4800*(
-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+45*arcsin(
c*x))*sin(4*arcsin(c*x))*d/c^4/(c^2*x^2-1))
```

Maxima [A]
time = 0.49, size = 149, normalized size = 0.66

$$-\frac{1}{35}\left(\frac{5\left(-c^{2} d x^{2}+d\right)^{\frac{5}{2}} x^{2}}{c^{2} d}+\frac{2\left(-c^{2} d x^{2}+d\right)^{\frac{5}{2}}}{c^{4} d}\right) b \arcsin\left(c x\right)-\frac{1}{35}\left(\frac{5\left(-c^{2} d x^{2}+d\right)^{\frac{5}{2}} x^{2}}{c^{2} d}+\frac{2\left(-c^{2} d x^{2}+d\right)^{\frac{5}{2}}}{c^{4} d}\right) a+\frac{\left(75\, c^{6} d^{\frac{3}{2}} x^{7}-168\, c^{4} d^{\frac{3}{2}} x^{5}+35\, c^{2} d^{\frac{3}{2}} x^{3}+210\, d^{\frac{3}{2}} x\right) b}{3675\, c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(5/2)/(c^4
*d))*b*arcsin(c*x) - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2*d
*x^2 + d)^(5/2)/(c^4*d))*a + 1/3675*(75*c^6*d^(3/2)*x^7 - 168*c^4*d^(3/2)*x
^5 + 35*c^2*d^(3/2)*x^3 + 210*d^(3/2)*x)*b/c^3
```

Fricas [A]
time = 4.09, size = 189, normalized size = 0.83

$$-\frac{\left(75\, b c^{7} d x^{7}-168\, b c^{5} d x^{5}+35\, b c^{3} d x^{3}+210\, b c d x\right) \sqrt{-c^{2} d x^{2}+d}\, \sqrt{-c^{2} x^{2}+1}+105\left(5\, a c^{8} d x^{8}-13\, a c^{6} d x^{6}+9\, a c^{4} d x^{4}+a c^{2} d x^{2}-2\, a d+\left(5\, b c^{8} d x^{8}-13\, b c^{6} d x^{6}+9\, b c^{4} d x^{4}+b c^{2} d x^{2}-2\, b d\right) \arcsin\left(c x\right)\right) \sqrt{-c^{2} d x^{2}+d}}{3675\left(c^{6} x^{2}-c^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*((75*b*c^7*d*x^7 - 168*b*c^5*d*x^5 + 35*b*c^3*d*x^3 + 210*b*c*d*x)*
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 105*(5*a*c^8*d*x^8 - 13*a*c^6*d*x
^6 + 9*a*c^4*d*x^4 + a*c^2*d*x^2 - 2*a*d + (5*b*c^8*d*x^8 - 13*b*c^6*d*x^6
+ 9*b*c^4*d*x^4 + b*c^2*d*x^2 - 2*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(
c^6*x^2 - c^4)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^3(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.80 $\int x(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=153

$$\frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))}{5c^2d}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^2/d+1/5*b*d*x*(-c^2*d*x^2+d)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-2/15*b*c*d*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)+1/25*b*c^3*d*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.05, antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {4767, 200}

$$-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))}{5c^2d}+\frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[d - c^2*d*x^2])/(5*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d*x^3*Sqrt[d -
 c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^5*Sqrt[d - c^2*d*x^2])/(25
*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{5c^2d} + \frac{\left(bd\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2}{5c\sqrt{1-c^2x^2}}$$
$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{5c^2d} + \frac{\left(bd\sqrt{d-c^2dx^2}\right)\int (1-2c^2x}{5c\sqrt{1-c^2x^2}}$$
$$= \frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} - \frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} - ($$

Mathematica [A]
time = 0.08, size = 103, normalized size = 0.67

$$-\frac{d\sqrt{d-c^2dx^2}\left(15a(-1+c^2x^2)^3+bcx\sqrt{1-c^2x^2}(15-10c^2x^2+3c^4x^4)+15b(-1+c^2x^2)^3\,\mathrm{ArcSin}(cx)\right)}{75c^2(-1+c^2x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/75*(d*Sqrt[d - c^2*d*x^2]*(15*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 - c^2*x^
2]*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 15*b*(-1 + c^2*x^2)^3*ArcSin[c*x]))/(c^2
*(-1 + c^2*x^2))
```

Maple [C] Result contains complex when optimal does not.
time = 0.13, size = 524, normalized size = 3.42

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{5}{2}}}{5c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(16c^6x^6-28c^4x^4-16i\sqrt{-c^2x^2+1}\,x^5c^5+13c^2x^2+20i\sqrt{-c^2x^2+1}\,x^3\right.}{800c^2(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*a/c^2/d*(-c^2*d*x^2+d)^(5/2)+b*(-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*
x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)
^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d/c^2/(c^2*x
^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arc
sin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(
1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-1)+1/96*(-d*(c^2*x^2-1))
^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c
-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/1200*(-d*(c^2*x^2-1))^
(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+45*arcsin(c*x))*cos(4*arcs
```

```
in(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^
2*x^2+1)^(1/2)-I)*(7*I+15*arcsin(c*x))*sin(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)
)
```

Maxima [A]
time = 0.49, size = 87, normalized size = 0.57

$$-\frac{(-c^2dx^2+d)^{\frac{5}{2}}b\arcsin(cx)}{5\,c^2d}-\frac{(-c^2dx^2+d)^{\frac{5}{2}}a}{5\,c^2d}+\frac{\left(3\,c^4d^{\frac{5}{2}}x^5-10\,c^2d^{\frac{5}{2}}x^3+15\,d^{\frac{5}{2}}x\right)b}{75\,cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/5*(-c^2*d*x^2 + d)^(5/2)*b*arcsin(c*x)/(c^2*d) - 1/5*(-c^2*d*x^2 + d)^(5
/2)*a/(c^2*d) + 1/75*(3*c^4*d^(5/2)*x^5 - 10*c^2*d^(5/2)*x^3 + 15*d^(5/2)*x
)*b/(c*d)
```

Fricas [A]
time = 3.46, size = 159, normalized size = 1.04

$$-\frac{(3\,bc^5dx^5-10\,bc^3dx^3+15\,bcdx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+15\,(ac^6dx^6-3\,ac^4dx^4+3\,ac^2dx^2-ad+(bc^6dx^6-3\,bc^4dx^4+3\,bc^2dx^2-bd)\arcsin(cx))\sqrt{-c^2dx^2+d}}{75\,(c^4x^2-c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/75*((3*b*c^5*d*x^5 - 10*b*c^3*d*x^3 + 15*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*s
qrt(-c^2*x^2 + 1) + 15*(a*c^6*d*x^6 - 3*a*c^4*d*x^4 + 3*a*c^2*d*x^2 - a*d +
 (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2
*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.81 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=278

$$-\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(c$$

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+d*(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)-4/3*b*c*d*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/9*b*c^3*d*x^
3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*d*(a+b*arcsin(c*x))*arctanh(I*c
*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+I*b*d*polylo
g(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*
d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)
```

Rubi [A]
time = 0.22, antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4787, 4783, 4803, 4268, 2317, 2438, 8}

$$\frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))+d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{2d\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{ibd\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ibd\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-4*b*c*d*x*Sqrt[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^3*Sqrt[
d - c^2*d*x^2])/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]) + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 - (2*d*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] +
(I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2
] - (I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{x}\,dx = \frac{1}{3}(d-c^2dx^2)^{3/2}\left(a+b\sin^{-1}(cx)\right) + d\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(}{x}$$

$$= -\frac{bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}\left(a+b\,\mathrm{s}\right.$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}\left(a+b\right.$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}\left(a+b\right.$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}\left(a+b\right.$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}\left(a+b\right.$$

Mathematica [A]
time = 0.68, size = 278, normalized size = 1.00

$$-\frac{1}{3}ad(-4+c^2x^2)\sqrt{d-c^2dx^2} + ad^{3/2}\log(x) - ad^{3/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{bd\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)+\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)-\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)+i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)-i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}} - \frac{bd\sqrt{d-c^2dx^2}\left(9cx-3\mathrm{ArcSin}(cx)\left(3\sqrt{1-c^2x^2}+\cos(3\mathrm{ArcSin}(cx))\right)+\sin(3\mathrm{ArcSin}(cx))\right)}{36\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/3*(a*d*(-4 + c^2*x^2)*Sqrt[d - c^2*d*x^2]) + a*d^(3/2)*Log[x] - a*d^(3/2
)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d*Sqrt[d - c^2*d*x^2]*(-(c*x) +
 Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - A
rcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] -
I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b*d*Sqrt[d - c^2*d*x
^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin
[3*ArcSin[c*x]]))/(36*Sqrt[1 - c^2*x^2])
```

Maple [A]
time = 0.19, size = 525, normalized size = 1.89

method	result
default	$\frac{(-c^2dx^2+d)^{\frac{3}{2}}a}{3} - a\,d^{\frac{3}{2}}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right) + a\sqrt{-c^2dx^2+d}\;d - \frac{b\sqrt{-d\,(c^2x^2-1)}\,d\sqrt{-}}{9(c^2x^2-1)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*a-a*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2)
)/x)+a*(-c^2*d*x^2+d)^(1/2)*d-1/9*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)*x^3*c^3+4/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*(-c^2*x
^2+1)^(1/2)*x*c+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*a
rcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-4/3*b*(
-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)+5/3*b*(-d*(c^2*x^2-1))^(1/2
)*d/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)
^(1/2)/(c^2*x^2-1)*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+I*b*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/
2))-1/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) - 1/3*(3*d^(3/2)*log(2*sqrt(-c^2*d*
x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (-c^2*d*x^2 + d)^(3/2) - 3*sqrt(-c^
2*d*x^2 + d)*d)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x, x)
```

3.82 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\textbf{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=297

$$-\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx}{2x^2}$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2-3/2*c^2*d*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)-1/2*b*c*d*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+b
*c^3*d*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3*c^2*d*(a+b*arcsin(c*x))*
arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3
/2*I*b*c^2*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^
2*x^2+1)^(1/2)+3/2*I*b*c^2*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.22, antiderivative size = 297, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4785, 4783, 4803, 4268, 2317, 2438, 8, 14}

$$-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{2x^2}+\frac{3c^2d\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{3ibc^2d\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{3ibc^2d\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d*Sqrt[d - c^2*d*x^2])/(x*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x*Sqrt[d
- c^2*d*x^2])/Sqrt[1 - c^2*x^2] - (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (3*c^2*d
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1
 - c^2*x^2] - (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSi
n[c*x])])/Sqrt[1 - c^2*x^2] + (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLo
g[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{2x^2} - \frac{1}{2}(3c^2d)\int \frac{\sqrt{d-c^2dx^2}\,(a+b\,\mathrm{s}}{x}$$

$$= -\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(c}{2x^2}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\,\mathrm{s}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\,\mathrm{s}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\,\mathrm{s}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\,\mathrm{s}$$

Mathematica [**A**]
time = 1.27, size = 389, normalized size = 1.31

$$-\frac{ad(1+2c^2x^2)\sqrt{d-c^2dx^2}}{2x^2} - \frac{3}{2}ac^2d^{3/2}\log(x) + \frac{3}{2}ac^2d^{3/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{bc^2d\sqrt{d-c^2dx^2}\left(cx-\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx) - \mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right) + \mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right) - i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right) + i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}} + \frac{bc^2d^2\sqrt{1-c^2x^2}\left(-2\cot\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - \mathrm{ArcSin}(cx)\csc^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 4\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right) + 4\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right) - 4i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right) + 4i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right) + \mathrm{ArcSin}(cx)\sec^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 2\tan\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}{8\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(a*d*(1 + 2*c^2*x^2)*Sqrt[d - c^2*d*x^2])/x^2 - (3*a*c^2*d^(3/2)*Log[x
])/2 + (3*a*c^2*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/2 + (b*c^2*d*
Sqrt[d - c^2*d*x^2]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*Log[
1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - I*PolyLog
[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^
2] + (b*c^2*d^2*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[
ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]
*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*
PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[Ar
cSin[c*x]/2]))/(8*Sqrt[d - c^2*d*x^2])
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 573 vs. 2(285) = 570.
time = 0.23, size = 574, normalized size = 1.93

method	result
default	$-\frac{a\left(-c^{2} d \,x^{2}+d \right)^{\frac{5}{2}}}{2 d \,x^{2}}-\frac{a \,c^{2} \left(-c^{2} d \,x^{2}+d \right)^{\frac{3}{2}}}{2}+\frac{3 a \,c^{2} d^{\frac{3}{2}} \ln \left(\frac{2 d +2 \sqrt{d}\, \sqrt{-c^{2} d \,x^{2}+d}}{x}\right)}{2}-\frac{3 a \,c^{2} \sqrt{-c^{2} d \,x^{2}+d}\, d}{2}-\frac{b}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(5/2)-1/2*a*c^2*(-c^2*d*x^2+d)^(3/2)+3/2*a*c^2*
d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-3/2*a*c^2*(-c^2*d*x^2+d)
^(1/2)*d-b*(-d*(c^2*x^2-1))^(1/2)*c^4*d/(c^2*x^2-1)*arcsin(c*x)*x^2-b*(-d*(
c^2*x^2-1))^(1/2)*c^3*d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+1/2*b*(-d*(c^2*x^2
-1))^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)+1/2*b*d*(-d*(c^2*x^2-1))^(1/2)/x/(
c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/2*b*d*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2
-1)*arcsin(c*x)-3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*
x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3*b*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1
)^(1/2))+3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2
)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)*c^2*d/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^3, x) + 1/2*(3*c^2*d^(3/2)*log(2*sqrt(-
c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (-c^2*d*x^2 + d)^(3/2)*c^2 -
3*sqrt(-c^2*d*x^2 + d)*c^2*d - (-c^2*d*x^2 + d)^(5/2)/(d*x^2))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\mathrm{asin}\,(cx))}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**3,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**3, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^3,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^3, x)
```

3.83 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\textbf{ArcSin}(cx))}{x^5}\,dx$

Optimal. Leaf size=307

$$-\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}+\frac{3c^2d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8x^2}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(}{4x^4}$$

```
[Out] -1/4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4+3/8*c^2*d*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)/x^2-1/12*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^3/(-c^2*x^2+1)^
(1/2)+5/8*b*c^3*d*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)-3/4*c^4*d*(a+b*
arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)+3/8*I*b*c^4*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-3/8*I*b*c^4*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.23, antiderivative size = 307, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4785, 4781, 30, 4803, 4268, 2317, 2438, 14}

$$\frac{3c^2d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8x^2}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{4x^4}-\frac{3c^4d\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4\sqrt{1-c^2x^2}}+\frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] -1/12*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^3*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt
[d - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x]))/(8*x^2) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4*
x^4) - (3*c^4*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin
[c*x])])/(4*Sqrt[1 - c^2*x^2]) + (((3*I)/8)*b*c^4*d*Sqrt[d - c^2*d*x^2]*Pol
yLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((3*I)/8)*b*c^4*d*Sqrt[d
- c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{x^5}\,dx = -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))}{4x^4} - \frac{1}{4}(3c^2d)\int \frac{\sqrt{d-c^2dx^2}\,(a+b}{x^3}$$

$$= \frac{3c^2d\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{8x^2} - \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx}{4x^4}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\,(a+b}{8x^2}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\,(a+b}{8x^2}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\,(a+b}{8x^2}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}\,(a+b}{8x^2}$$

Mathematica [**A**]
time = 3.76, size = 494, normalized size = 1.61

$$\frac{ad(-2+5c^2x^2)\sqrt{d-c^2dx^2}}{8x^4} + \frac{3}{8}ac^4d^{3/2}\log(x) - \frac{3}{8}ac^4d^{3/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) - \frac{bc^4d^2\sqrt{1-c^2x^2}\left(-2\cot\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - \mathrm{ArcSin}(cx)\csc^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 4\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right) + 4\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right) - 4i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right) + 4i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right) + \mathrm{ArcSin}(cx)\sec^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 2\tan\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}{8\sqrt{d-c^2dx^2}} + \frac{bc^4d\sqrt{d-c^2dx^2}\left(8\cot\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) + 6\mathrm{ArcSin}(cx)\csc^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - cx\csc^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 3\mathrm{ArcSin}(cx)\csc^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - 24\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right) + 24\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right) - 24i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right) + 24i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right) - 6\mathrm{ArcSin}(cx)\sec^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) + 3\mathrm{ArcSin}(cx)\sec^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right) - \frac{16\sin^4\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)}{c^3x^3} + 8\tan\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}{192\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*d*(-2 + 5*c^2*x^2)*Sqrt[d - c^2*d*x^2])/(8*x^4) + (3*a*c^4*d^(3/2)*Log[x
])/8 - (3*a*c^4*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/8 - (b*c^4*d^
2*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]
^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*
ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(
I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))
/(8*Sqrt[d - c^2*d*x^2]) + (b*c^4*d*Sqrt[d - c^2*d*x^2]*(8*Cot[ArcSin[c*x]/
2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - c*x*Csc[ArcSin[c*x]/2]^4 - 3*ArcS
in[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] +
24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (24*I)*PolyLog[2, -E^(I*ArcSin[
c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin[c*x])] - 6*ArcSin[c*x]*Sec[ArcSin[c*
x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^4 - (16*Sin[ArcSin[c*x]/2]^4)/(c
^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*Sqrt[1 - c^2*x^2])
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 600 vs. 2(291) = 582.
time = 0.28, size = 601, normalized size = 1.96

method	result
default	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{4 d\,x^{4}}+\frac{a\,c^{2} \left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{8 d\,x^{2}}+\frac{a\,c^{4} \left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{8}-\frac{3 a\,c^{4} d^{\frac{3}{2}} \ln \left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)}{8}+\frac{3 a\,c^{4} \sqrt{-c}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(5/2)+1/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(5/2)+1/8*
a*c^4*(-c^2*d*x^2+d)^(3/2)-3/8*a*c^4*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+
d)^(1/2))/x)+3/8*a*c^4*(-c^2*d*x^2+d)^(1/2)*d+5/8*b*d*(-d*(c^2*x^2-1))^(1/2
)/(c^2*x^2-1)*arcsin(c*x)*c^4-5/8*b*d*(-d*(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*
(-c^2*x^2+1)^(1/2)*c^3-7/8*b*d*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)*arcsi
n(c*x)*c^2+1/12*b*d*(-d*(c^2*x^2-1))^(1/2)/x^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*c+1/4*b*d*(-d*(c^2*x^2-1))^(1/2)/x^4/(c^2*x^2-1)*arcsin(c*x)+3*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d*c^4/(8*c^2*x^2-8)*ln(1+I*c*x+(-c^2*x^2
+1)^(1/2))*arcsin(c*x)-3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d*c^4/
(8*c^2*x^2-8)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))*arcsin(c*x)-3*I*b*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d*c^4/(8*c^2*x^2-8)*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d*c^4/(8*c^2*x^
2-8)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^5, x) - 1/8*(3*c^4*d^(3/2)*log(2*sqrt(-
c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (-c^2*d*x^2 + d)^(3/2)*c^4 -
3*sqrt(-c^2*d*x^2 + d)*c^4*d - (-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^2) + 2*(-c^2
*d*x^2 + d)^(5/2)/(d*x^4))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^5, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**5, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,(d-c^2\,d\,x^2)^{3/2}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^5,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^5, x)
```

3.84 $\int x^4(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=430

$$\frac{3bd^2x^2\sqrt{d-c^2dx^2}}{512c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}}-\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}+\frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{10}\sqrt{d-c^2d}}{100\sqrt{1-c^2x^2}}$$

```
[Out] 1/16*d*x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/10*x^5*(-c^2*d*x^2+d)^(
5/2)*(a+b*arcsin(c*x))-3/256*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c
^4-1/128*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/32*d^2*x^5*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+3/512*b*d^2*x^2*(-c^2*d*x^2+d)^(1/2)/c
^3/(-c^2*x^2+1)^(1/2)+1/512*b*d^2*x^4*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(
1/2)-31/960*b*c*d^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+21/640*b*c^
3*d^2*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/100*b*c^5*d^2*x^10*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/512*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x
^2+d)^(1/2)/b/c^5/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.38, antiderivative size = 430, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4787, 4783, 4795, 4737, 30, 14, 272, 45}

$$\frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{d^2x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{128c^2}+\frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))+\frac{1}{16}dx^5\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))+\frac{3d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{512bc^5\sqrt{1-c^2x^2}}-\frac{3d^2x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{256c^4}-\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}+\frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{10}\sqrt{d-c^2dx^2}}{100\sqrt{1-c^2x^2}}+\frac{3bd^2x^2\sqrt{d-c^2dx^2}}{512c^3\sqrt{1-c^2x^2}}+\frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(512*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^4*
Sqrt[d - c^2*d*x^2])/(512*c*Sqrt[1 - c^2*x^2]) - (31*b*c*d^2*x^6*Sqrt[d - c
^2*d*x^2])/(960*Sqrt[1 - c^2*x^2]) + (21*b*c^3*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(640*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^10*Sqrt[d - c^2*d*x^2])/(100*Sqrt[1
 - c^2*x^2]) - (3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(256*c^4)
- (d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^2) + (d^2*x^5*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/32 + (d*x^5*(d - c^2*d*x^2)^(3/2)*(a
 + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/10
+ (3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(512*b*c^5*Sqrt[1 - c^2
*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
```

```
b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d\int x^4\left(d-c^2dx^2\right)^{3/2}\left(\right.$$

$$=\frac{1}{16}dx^5\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}\left(a-\right.$$

$$=\frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{16}dx^5\left(d-c^2dx^2\right)^{3/2}\left(a+\right.$$

$$=-\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}+\frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{10}\sqrt{d}}{100\sqrt{1-}}$$

$$=\frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}}-\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}+\frac{21bc^3d^2x^8\sqrt{d-c^2}}{640\sqrt{1-c^2x^2}}$$

$$=\frac{3bd^2x^2\sqrt{d-c^2dx^2}}{512c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}}-\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.16, size = 220, normalized size = 0.51

$$\frac{d^2\sqrt{d-c^2dx^2}\left(225a^2+b^2c^2x^2(225+75c^2x^2-1240c^4x^4+1260c^6x^6-384c^8x^8)+30abcx\sqrt{1-c^2x^2}\,(-15-10c^2x^2+248c^4x^4-336c^6x^6+128c^8x^8)+30b\left(15a+bcx\sqrt{1-c^2x^2}\,(-15-10c^2x^2+248c^4x^4-336c^6x^6+128c^8x^8)\right)\mathrm{ArcSin}(cx)+225b^2\mathrm{ArcSin}(cx)^2\right)}{38400bc^5\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(225*a^2 + b^2*c^2*x^2*(225 + 75*c^2*x^2 - 1240*c^
4*x^4 + 1260*c^6*x^6 - 384*c^8*x^8) + 30*a*b*c*x*Sqrt[1 - c^2*x^2]*(-15 - 1
0*c^2*x^2 + 248*c^4*x^4 - 336*c^6*x^6 + 128*c^8*x^8) + 30*b*(15*a + b*c*x*S
qrt[1 - c^2*x^2]*(-15 - 10*c^2*x^2 + 248*c^4*x^4 - 336*c^6*x^6 + 128*c^8*x^
8))*ArcSin[c*x] + 225*b^2*ArcSin[c*x]^2))/(38400*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.51, size = 1106, normalized size = 2.57

method	result
default	$-\frac{a\,x^3(-c^2dx^2+d)^{\frac{7}{2}}}{10c^2d}-\frac{3ax(-c^2dx^2+d)^{\frac{7}{2}}}{80c^4d}+\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{160c^4}+\frac{adx(-c^2dx^2+d)^{\frac{3}{2}}}{128c^4}+\frac{3a\,d^2x\sqrt{-c^2d\,x^2+d}}{256c^4}+\frac{3a\,d^3}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/10*a*x^3*(-c^2*d*x^2+d)^(7/2)/c^2/d-3/80*a/c^4*x*(-c^2*d*x^2+d)^(7/2)/d+
1/160*a/c^4*x*(-c^2*d*x^2+d)^(5/2)+1/128*a/c^4*d*x*(-c^2*d*x^2+d)^(3/2)+3/2
56*a/c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)+3/256*a/c^4*d^3/(c^2*d)^(1/2)*arctan((c
^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3/512*(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/102400*(-d*(c^2*x^2-1))^(1
/2)*(-512*I*(-c^2*x^2+1)^(1/2)*x^10*c^10+512*c^11*x^11+1280*I*(-c^2*x^2+1)^
(1/2)*x^8*c^8-1536*c^9*x^9-1120*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+1696*c^7*x^7+4
00*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-832*c^5*x^5-50*I*(-c^2*x^2+1)^(1/2)*x^2*c^2
+170*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-10*c*x)*(I+10*arcsin(c*x))*d^2/c^5/(c^2*x
^2-1)+1/2048*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x
^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)-3/819
200*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+40*ar
csin(c*x))*cos(9*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)+1/819200*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(17*I+280*arcsin(c*x))*sin(9*ar
csin(c*x))*d^2/c^5/(c^2*x^2-1)+1/98304*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*
x*(-c^2*x^2+1)^(1/2)-I)*(5*I+72*arcsin(c*x))*cos(7*arcsin(c*x))*d^2/c^5/(c^
2*x^2-1)-1/98304*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1
)*(11*I+24*arcsin(c*x))*sin(7*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)+1/12288*(-d*
(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(7*I+18*arcsin(c*x)
)*cos(5*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)-5/12288*(-d*(c^2*x^2-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(I+6*arcsin(c*x))*sin(5*arcsin(c*x))*d^2/
c^5/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(
1/2)-I)*arcsin(c*x)*cos(3*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)-1/1024*(-d*(c^2*
x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*sin(3*ar
csin(c*x))*d^2/c^5/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) - 1/1280*(128*
```

```
(-c^2*d*x^2 + d)^(7/2)*x^3/(c^2*d) - 8*(-c^2*d*x^2 + d)^(5/2)*x/c^4 + 48*(-
c^2*d*x^2 + d)^(7/2)*x/(c^4*d) - 10*(-c^2*d*x^2 + d)^(3/2)*d*x/c^4 - 15*sqr
t(-c^2*d*x^2 + d)*d^2*x/c^4 - 15*d^(5/2)*arcsin(c*x)/c^5)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((a*c^4*d^2*x^8 - 2*a*c^2*d^2*x^6 + a*d^2*x^4 + (b*c^4*d^2*x^8 - 2*
b*c^2*d^2*x^6 + b*d^2*x^4)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
[Out] Exception raised: SystemError >> excessive stack use: stack is 3876 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^4, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.85 $\int x^2(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=351

$$\frac{5bd^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{5d^2x\sqrt{d-c^2d}}{}$$

```
[Out] 5/48*d*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/8*x^3*(-c^2*d*x^2+d)^(5
/2)*(a+b*arcsin(c*x))-5/128*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^
2+5/64*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/256*b*d^2*x^2*(-c^2
*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-59/768*b*c*d^2*x^4*(-c^2*d*x^2+d)^(1/2
)/(-c^2*x^2+1)^(1/2)+17/288*b*c^3*d^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)-1/64*b*c^5*d^2*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/256*d^2
*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.32, antiderivative size = 351, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4787, 4783, 4795, 4737, 30, 14, 272, 45}

$$-\frac{5d^2x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{128c^2}+\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))+\frac{5d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{256bc^3\sqrt{1-c^2x^2}}+\frac{5bd^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(768*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x^6*Sqrt[d
- c^2*d*x^2])/(288*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(64*Sqrt[1 - c^2*x^2]) - (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(128*c^2) + (5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/64 + (5*d*
x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/48 + (x^3*(d - c^2*d*x^2)^(5
/2)*(a + b*ArcSin[c*x]))/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
^2)/(256*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
```

```
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}(5d)\int x^2\left(d-c^2dx^2\right)^{3/}$$

$$=\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}\left(a\right.$$

$$=\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}\left(a\right.$$

$$=-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8\sqrt{d}}{64\sqrt{1-}}$$

$$=\frac{5bd^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-}}{288\sqrt{1-c^2}}$$

Mathematica [A]
time = 0.13, size = 196, normalized size = 0.56

$$\frac{d^2\sqrt{d-c^2dx^2}\left(45a^2+b^2c^2x^2(45-177c^2x^2+136c^4x^4-36c^6x^6)+6abcx\sqrt{1-c^2x^2}(-15+118c^2x^2-136c^4x^4+48c^6x^6)+6b\left(15a+bcx\sqrt{1-c^2x^2}(-15+118c^2x^2-136c^4x^4+48c^6x^6)\right)\mathrm{ArcSin}(cx)+45b^2\mathrm{ArcSin}(cx)^2\right)}{2304bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(45*a^2 + b^2*c^2*x^2*(45 - 177*c^2*x^2 + 136*c^4*
x^4 - 36*c^6*x^6) + 6*a*b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^
4*x^4 + 48*c^6*x^6) + 6*b*(15*a + b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^
2 - 136*c^4*x^4 + 48*c^6*x^6))*ArcSin[c*x] + 45*b^2*ArcSin[c*x]^2))/(2304*b
*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.28, size = 907, normalized size = 2.58

method	result
default	$-\frac{ax\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{8c^2d}+\frac{ax\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{48c^2}+\frac{5adx\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{192c^2}+\frac{5a\,d^2x\sqrt{-c^2d\,x^2+d}}{128c^2}+\frac{5a\,d^3\arctan\left(\frac{\sqrt{c^2d}}{\sqrt{-c^2d\,x^2}}\right.}{128c^2\sqrt{c^2d}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*a*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/48*a/c^2*x*(-c^2*d*x^2+d)^(5/2)+5/192
*a/c^2*d*x*(-c^2*d*x^2+d)^(3/2)+5/128*a/c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/12
8*a/c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-
5/256*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)
^2*d^2+1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+12
8*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-c^2*x^2+1)^(
1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-88*c^3*x^3-I*(-c^2
*x^2+1)^(1/2)+8*c*x)*(I+8*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x
^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)
-2*c*x)*(-I+2*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/147456*(-d*(c^2*x^2-1))^(1
/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(73*I+312*arcsin(c*x))*cos(7*arcsi
n(c*x))*d^2/c^3/(c^2*x^2-1)-1/147456*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)
^(1/2)*x*c+c^2*x^2-1)*(55*I+456*arcsin(c*x))*sin(7*arcsin(c*x))*d^2/c^3/(c^
2*x^2-1)+1/9216*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)
*(13*I+12*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-5/9216*(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(I+12*arcsin(c*x))*si
n(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c
^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(I+4*arcsin(c*x))*cos(3*arcsin(c*x))*d^2/c^3/(
c^2*x^2-1)+1/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*(5*I+4*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/384*(8*(-c
^2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*
d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*a
rcsin(c*x)/c^3)*a
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^6 - 2*a*c^2*d^2*x^4 + a*d^2*x^2 + (b*c^4*d^2*x^6 - 2*
b*c^2*d^2*x^4 + b*d^2*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.86 $\int \left(d-c^2dx^2\right)^{5/2} (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=265

$$-\frac{25bcd^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{5bc^3d^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\,(a+b\text{ArcS}$$

```
[Out] 5/24*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/6*x*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))+1/36*b*d^2*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+5/16
*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-25/96*b*c*d^2*x^2*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/96*b*c^3*d^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*
x^2+1)^(1/2)+5/32*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^
2+1)^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4743, 4741, 4737, 30, 14, 267}

$$\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{5d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{32bc\sqrt{1-c^2x^2}}+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))-\frac{25bcd^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5bc^3d^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-25*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2
*x^4*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*d^2*(1 - c^2*x^2)^(5/
2)*Sqrt[d - c^2*d*x^2])/(36*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]))/16 + (5*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (x*(d -
 c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/(32*b*c*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}(5d)\int \left(d-c^2dx^2\right)^{3/2}\left(a+\right.$$

$$=\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(\right.$$

$$=\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx\right.$$

$$=-\frac{25bcd^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{5bc^3d^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bd^2(1-c^2x^2)^5}{3}$$

Mathematica [A]
time = 0.57, size = 266, normalized size = 1.00

$$\frac{d^2\left(360b\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)^2-720a\sqrt{d}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+\sqrt{d-c^2dx^2}\left(1584acx\sqrt{1-c^2x^2}-1248ac^3x^3\sqrt{1-c^2x^2}+384ac^5x^5\sqrt{1-c^2x^2}+270b\cos(2\mathrm{ArcSin}(cx))+27b\cos(4\mathrm{ArcSin}(cx))+2b\cos(6\mathrm{ArcSin}(cx))\right)+12b\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)(45\sin(2\mathrm{ArcSin}(cx))+9\sin(4\mathrm{ArcSin}(cx))+\sin(6\mathrm{ArcSin}(cx)))\right)}{2304c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(360*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 - 720*a*Sqrt[d]*Sqrt[1 - c^2*
x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d -
c^2*d*x^2]*(1584*a*c*x*Sqrt[1 - c^2*x^2] - 1248*a*c^3*x^3*Sqrt[1 - c^2*x^2]
 + 384*a*c^5*x^5*Sqrt[1 - c^2*x^2] + 270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*
ArcSin[c*x]] + 2*b*Cos[6*ArcSin[c*x]]) + 12*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*
x]*(45*Sin[2*ArcSin[c*x]] + 9*Sin[4*ArcSin[c*x]] + Sin[6*ArcSin[c*x]])))/(2
304*c*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.14, size = 691, normalized size = 2.61

method	result
default	$\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{6}+\frac{5adx(-c^2dx^2+d)^{\frac{3}{2}}}{24}+\frac{5a\,d^2x\sqrt{-c^2d\,x^2+d}}{16}+\frac{5a\,d^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{16\sqrt{c^2d}}+b\Bigg(-\frac{5\sqrt{-}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*a*x*(-c^2*d*x^2+d)^(5/2)+5/24*a*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a*d^2*x*(
-c^2*d*x^2+d)^(1/2)+5/16*a*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2))+b*(-5/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^
2-1)*arcsin(c*x)^2*d^2+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1
/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^
2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(I+6*arcsin(c
*x))*d^2/c/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2/c/(c
^2*x^2-1)-1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I
)*(29*I+96*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)+5/4608*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(5*I+24*arcsin(c*x))*s
in(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-3/512*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2
-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+16*arcsin(c*x))*cos(3*arcsin(c*x))*d^2/c/(
c^2*x^2-1)+9/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1
)*(3*I+8*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/48*(8*(-c^2*d*
x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(-c^2*d*x^2 + d)*
d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int (-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x)), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\operatorname{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.87 $\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\mathbf{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=268

$$\frac{9bc^3d^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a$$

```
[Out] -5/4*c^2*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-(-c^2*d*x^2+d)^(5/2)*(a
+b*arcsin(c*x))/x-15/8*c^2*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+9/1
6*b*c^3*d^2*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^5*d^2*x^4*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-15/16*c*d^2*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+b*c*d^2*ln(x)*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4785, 4743, 4741, 4737, 30, 14, 272, 45}

$$-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))-\frac{15cd^2\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2}{16b\sqrt{1-c^2x^2}}-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\mathrm{ArcSin}(cx))-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\mathrm{ArcSin}(cx))}{x}+\frac{bcd^2\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{9bc^3d^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (9*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (15*c^2*d^2*x*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x]))/8 - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/4 - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x - (15*c*d^2*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*Sqrt[1 - c^2*x^2]) + (b*c*d
^2*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x} - \left(5c^2d\right)\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\right.$$

$$= -\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-}\right.}{x}$$

$$= -\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}\left(a+\right.$$

$$= \frac{9bc^3d^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}$$

Mathematica [A]
time = 0.59, size = 257, normalized size = 0.96

$$\frac{d^2\left(-120bcx\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)^2+240ac\sqrt{d}\,x\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+\sqrt{d-c^2dx^2}\left(-32bcx\cos(2\text{ArcSin}(cx))-bcx\cos(4\text{ArcSin}(cx))+16\left(a\sqrt{1-c^2x^2}\,(-8-9c^2x^2+2c^4x^4)+8bcx\log(cx)\right)\right)-4b\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)\left(32\sqrt{1-c^2x^2}+16cx\sin(2\text{ArcSin}(cx))+cx\sin(4\text{ArcSin}(cx))\right)\right)}{128x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (d^2*(-120*b*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 + 240*a*c*Sqrt[d]*x*Sqrt
[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] +
Sqrt[d - c^2*d*x^2]*(-32*b*c*x*Cos[2*ArcSin[c*x]] - b*c*x*Cos[4*ArcSin[c*x]
] + 16*(a*Sqrt[1 - c^2*x^2]*(-8 - 9*c^2*x^2 + 2*c^4*x^4) + 8*b*c*x*Log[c*x]
)) - 4*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(32*Sqrt[1 - c^2*x^2] + 16*c*x*Sin
[2*ArcSin[c*x]] + c*x*Sin[4*ArcSin[c*x]])))/(128*x*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.25, size = 1391, normalized size = 5.19

method	result	size
default	Expression too large to display	1391

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -17/64*b*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^3/(c^2*x^2-1)*arcs
in(c*x)*x^2+31/256*b*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^2/(c^2
*x^2-1)*(-c^2*x^2+1)^(1/2)*x+79/64*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/(c^2*x^2-1)*arcsin(c*x)*d^2*c-15/64*I*b*(-d*(c^2*x^2-1))^(1/2)*cos(3*
arcsin(c*x))*d^2*c/(c^2*x^2-1)*arcsin(c*x)-31/256*I*b*(-d*(c^2*x^2-1))^(1/2
```

```
)*sin(3*arcsin(c*x))*d^2*c^3/(c^2*x^2-1)*x^2-5/4*a*c^2*d*x*(-c^2*d*x^2+d)^(
3/2)-15/8*a*c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)-15/8*a*c^2*d^3/(c^2*d)^(1/2)*arc
tan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-a/d/x*(-c^2*d*x^2+d)^(7/2)-a*c^2*
x*(-c^2*d*x^2+d)^(5/2)+b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*d^2/(c^2*x^2-1)
/x+33/256*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+33/
256*b*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c/(c^2*x^2-1)-15/64*b*(
-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*x-1/8*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*arcsi
n(c*x)*(-c^2*x^2+1)^(1/2)*x^4-3/8*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x
^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+15/64*I*b*(-d*(c^2*x^2-1))^(1/2)*c
os(3*arcsin(c*x))*d^2*c^3/(c^2*x^2-1)*arcsin(c*x)*x^2-33/256*I*b*(-d*(c^2*x
^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-17
/64*I*b*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*arcsi
n(c*x)*(-c^2*x^2+1)^(1/2)*x+1/32*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-
1)*(-c^2*x^2+1)^(1/2)*x^4-9/32*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*x^2-33/256*b*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*
d^2*c^3/(c^2*x^2-1)*x^2+15/16*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
c^2*x^2-1)*arcsin(c*x)^2*d^2*c-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d^2*c+1/8*b*(-d*(c^2*x^2-1))
^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)*x^5-11/16*b*(-d*(c^2*x^2-1))^(1/2)*d
^2*c^4/(c^2*x^2-1)*arcsin(c*x)*x^3-7/16*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c
^2*x^2-1)*arcsin(c*x)*x+17/64*b*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d
^2*c/(c^2*x^2-1)*arcsin(c*x)+1/32*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x
^2-1)*x^5+13/64*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*x^3-15/64*I*
b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*x+31/256*I*b*(-d*(c^2*x^2-1))^
(1/2)*sin(3*arcsin(c*x))*d^2*c/(c^2*x^2-1)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^2, x) - 1/8*(10*(-c^
2*d*x^2 + d)^(3/2)*c^2*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^2*d^2*x + 15*c*d^(5/
2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)/x)*a
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\,\mathrm{asin}\,(cx))}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^2, x)
```

3.88 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=277

$$-\frac{bcd^2\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{5c^2d(d-c^2dx^2)^{3/2}\,(a+b$$

```
[Out] 5/3*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x-1/3*(-c^2*d*x^2+d)^(5/2)
*(a+b*arcsin(c*x))/x^3+5/2*c^4*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)
-1/6*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-1/4*b*c^5*d^2*x^2*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/4*c^3*d^2*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)-7/3*b*c^3*d^2*ln(x)*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.21, antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4785, 4741, 4737, 30, 14, 272, 45}

$$\frac{5c^2d(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3x}-\frac{(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{3x^3}+\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{5c^3d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{4b\sqrt{1-c^2x^2}}-\frac{bcd^2\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}-\frac{7bc^3d^2\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^2*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^2
*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/2 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x]))/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(3*x^3) + (5*c^3*
d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 - c^2*x^2]) - (7
*b*c^3*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^4}dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{3x^3} - \frac{1}{3}(5c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a+}{x^2}$$

$$= \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(}{3x^3}$$

$$= \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\sin}{3x}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}($$

Mathematica [A]
time = 0.93, size = 243, normalized size = 0.88

$$\frac{1}{24}d^2\left(\frac{4b\sqrt{d-c^2dx^2}(-2+14c^2x^2+3c^4x^4)\text{ArcSin}(cx)}{x^3} + \frac{30bc^3\sqrt{d-c^2dx^2}\text{ArcSin}(cx)^2}{\sqrt{1-c^2x^2}} - 60ac^3\sqrt{d}\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right) + \frac{\sqrt{d-c^2dx^2}\left(4a\sqrt{1-c^2x^2}(-2+14c^2x^2+3c^4x^4)+b(-4cx+3c^3x^3-6c^5x^5)-56bc^3x^3\log(cx)\right)}{x^3\sqrt{1-c^2x^2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (d^2*((4*b*Sqrt[d - c^2*d*x^2]*(-2 + 14*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x])/x
^3 + (30*b*c^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 60*a*
c^3*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + (S
qrt[d - c^2*d*x^2]*(4*a*Sqrt[1 - c^2*x^2]*(-2 + 14*c^2*x^2 + 3*c^4*x^4) + b
*(-4*c*x + 3*c^3*x^3 - 6*c^5*x^5) - 56*b*c^3*x^3*Log[c*x]))/(x^3*Sqrt[1 - c
^2*x^2])))/24
```

Maple [C] Result contains complex when optimal does not.
time = 0.32, size = 1527, normalized size = 5.51

method	result	size
default	Expression too large to display	1527

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] 147*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1
)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-35*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*
c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5-1/
3*a/d/x^3*(-c^2*d*x^2+d)^(7/2)+4/3*a*c^4*x*(-c^2*d*x^2+d)^(5/2)-14*I*b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*d^2*c^3/(3*c^2*x^2-3)+147
```

```
*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*arc
sin(c*x)*c^8-203*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3
/(c^2*x^2-1)*arcsin(c*x)*c^6+21/2*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-
15*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+190/3*b*(-d*(c^2*x^2-1
))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-23/3*b
*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(
c*x)*c^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^2/(c^
2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-49/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x
^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8-7/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63
*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+28/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^
2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6+4/3*a*c^2/d/x*(-c^2*d*x^2+d
)^(7/2)+5/3*a*c^4*d*x*(-c^2*d*x^2+d)^(3/2)+5/2*a*c^4*d^2*x*(-c^2*d*x^2+d)^(
1/2)+5/2*a*c^4*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2
))+7/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)
*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+7/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*
c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4-1/8*b*(-d*(c^2*x^2-1))
^(1/2)*d^2*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-5/2*b*(-d*(c^2*x^2-1))^(1/2)*
d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3+7/3*b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1
/2))^2-1)*d^2*c^3-5/4*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-
1)*arcsin(c*x)^2*d^2*c^3+1/2*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*a
rcsin(c*x)*x^3-1/2*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)
*x+1/3*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^3/(c^2*x^2-
1)*arcsin(c*x)+1/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*(-c^2*x^2+1
)^(1/2)*x^2-49/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x
^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^4, x) + 1/6*(10*(-c^
2*d*x^2 + d)^(3/2)*c^4*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^4*d^2*x + 15*c^3*d^(
5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)*c^2/x - 2*(-c^2*d*x^2 + d)^(7/2
)/(d*x^3))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**4, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^4, x)
```

3.89 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}{x^6}\,dx$

Optimal. Leaf size=277

$$-\frac{bcd^2\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{11bc^3d^2\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}-\frac{c^4d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x}+\frac{c^2d(d-c^2dx^2)^{3/2}\,(a+b\text{Arc}}{3x^3}$$

```
[Out] 1/3*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3-1/5*(-c^2*d*x^2+d)^(5/
2)*(a+b*arcsin(c*x))/x^5-c^4*d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x-1
/20*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)+11/30*b*c^3*d^2*(-c
^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-1/2*c^5*d^2*(a+b*arcsin(c*x))^2*(-
c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+23/15*b*c^5*d^2*ln(x)*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.25, antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4785, 4781, 29, 4737, 14, 272, 45}

$$-\frac{(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{5x^5}+\frac{c^2d(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3x^3}-\frac{c^5d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2b\sqrt{1-c^2x^2}}-\frac{c^4d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x}-\frac{bcd^2\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{23bc^5d^2\log(x)\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -1/20*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^4*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2
*Sqrt[d - c^2*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - (c^4*d^2*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]))/x + (c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/(3*x^3) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*x^5) - (c^5*d
^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (23
*b*c^5*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^6}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{5x^5} - (c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a+b\,\mathrm{si}}{x^4}$$

$$= \frac{c^2d(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{3x^3} - \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx}{5x^5}$$

$$= -\frac{c^4d^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x} + \frac{c^2d(d-c^2dx^2)^{3/2}(a+b\sin^{-1}}{3x^3}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{11bc^3d^2\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{c^4d^2\sqrt{d-c^2dx^2}\,(a+}{x}$$

<u>**Mathematica**</u> [A]
time = 0.86, size = 234, normalized size = 0.84

$$\frac{1}{60}d^2\left(-\frac{4b\sqrt{d-c^2dx^2}\,(3-11c^2x^2+23c^4x^4)\,\mathrm{ArcSin}(cx)}{x^5} - \frac{30bc^5\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)^2}{\sqrt{1-c^2x^2}} + 60ac^5\sqrt{d}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right) + \frac{\sqrt{d-c^2dx^2}\,\left(bcx(-3+22c^2x^2)-4a\sqrt{1-c^2x^2}\,(3-11c^2x^2+23c^4x^4)+92bc^5x^5\log(cx)\right)}{x^5\sqrt{1-c^2x^2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] (d^2*((-4*b*Sqrt[d - c^2*d*x^2]*(3 - 11*c^2*x^2 + 23*c^4*x^4)*ArcSin[c*x])/
x^5 - (30*b*c^5*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + 60*a
*c^5*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + (
Sqrt[d - c^2*d*x^2]*(b*c*x*(-3 + 22*c^2*x^2) - 4*a*Sqrt[1 - c^2*x^2]*(3 - 1
1*c^2*x^2 + 23*c^4*x^4) + 92*b*c^5*x^5*Log[c*x]))/(x^5*Sqrt[1 - c^2*x^2])))
/60
```

<u>**Maple**</u> [C] Result contains complex when optimal does not.
time = 0.34, size = 2615, normalized size = 9.44

method	result	size
default	Expression too large to display	2615

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] -69/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-
75*c^2*x^2+9)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5+5819/30*I*b*(-
d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9
)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-7153/60*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/
(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*(-c^2*x
```

^2+1)*c^10-759/2*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325
*c^4*x^4-75*c^2*x^2+9)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-9602/15*b*(-
d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9
)*x/(c^2*x^2-1)*arcsin(c*x)*c^6+777/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^
8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/x/(c^2*x^2-1)*arcsin(c*x)*c^4-1
41/20*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75
*c^2*x^2+9)/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-117/5*b*(-d*(c^2*x^2-1))
^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/x^3/(c^2*x^2
-1)*arcsin(c*x)*c^2+9/20*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6
*x^6+325*c^4*x^4-75*c^2*x^2+9)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-1587*b*
(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2
+9)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^14+3519*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(103
5*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^7/(c^2*x^2-1)*arcsin(c*x)
*c^12-9595/3*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4
*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^10+1329/4*b*(-d*(c^2*x^2-1
))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^4/(c^2*x
^2-1)*(-c^2*x^2+1)^(1/2)*c^9+5318/3*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*
x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^8-1
889/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-7
5*c^2*x^2+9)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7+69/20*I*b*(-d*(c^2*x^2-
1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x/(c^2*x^
2-1)*c^6+46*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*d^2*c
^5/(15*c^2*x^2-15)+5819/30*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765
*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^9/(c^2*x^2-1)*c^14-18791/60*I*b*(-d*(c
^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^
7/(c^2*x^2-1)*c^12+943/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c
^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*c^10-207/5*I*b*(-d*(c^2*x^
2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^3/(c^
2*x^2-1)*c^8-2/3*a*c^6*d*x*(-c^2*d*x^2+d)^(3/2)-a*c^6*d^2*x*(-c^2*d*x^2+d)^
(1/2)-a*c^6*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-
8/15*a*c^4/d/x*(-c^2*d*x^2+d)^(7/2)+2/15*a*c^2/d/x^3*(-c^2*d*x^2+d)^(7/2)-1
/5*a/d/x^5*(-c^2*d*x^2+d)^(7/2)-8/15*a*c^6*x*(-c^2*d*x^2+d)^(5/2)+759/20*I*
b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x
^2+9)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^8-69/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2
/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x/(c^2*x^2-1)*(-c^2*x^
2+1)*c^6-23/15*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((
I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d^2*c^5+1/2*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*d^2*c^5+175/4*b*(-d*(c^2*x^2-1))^(1/2
)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)*c^5+9/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^
6+325*c^4*x^4-75*c^2*x^2+9)/x^5/(c^2*x^2-1)*arcsin(c*x)+1173*I*b*(-d*(c^2*x
^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^6/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^11-1495/3*I*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^4/(c^2*x^2-1
)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^9+115*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(10

```
35*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^2/(c^2*x^2-1)*(-c^2*x^2+
1)^(1/2)*arcsin(c*x)*c^7-1587*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-
765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*ar
csin(c*x)*c^13
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^6, x) - 1/15*(10*(-c
^2*d*x^2 + d)^(3/2)*c^6*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^6*d^2*x + 15*c^5*d^
(5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)*c^4/x - 2*(-c^2*d*x^2 + d)^(7/
2)*c^2/(d*x^3) + 3*(-c^2*d*x^2 + d)^(7/2)/(d*x^5))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^6, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**6, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^6,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^6, x)
```

3.90 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))}{x^8}\,dx$

Optimal. Leaf size=203

$$-\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}}-\frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{7dx^7}-\frac{bc^7d^2\sqrt{d-}}{7\sqrt{}}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/d/x^7-1/42*b*c*d^2*(-c^2*d*x^2+
d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+3/28*b*c^3*d^2*(-c^2*d*x^2+d)^(1/2)/x^4/(-c
^2*x^2+1)^(1/2)-3/14*b*c^5*d^2*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-
1/7*b*c^7*d^2*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4771, 272, 45}

$$-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{7dx^7}-\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}-\frac{bc^7d^2\log(x)\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}-\frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}}+\frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/42*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*
Sqrt[d - c^2*d*x^2])/(28*x^4*Sqrt[1 - c^2*x^2]) - (3*b*c^5*d^2*Sqrt[d - c^2
*d*x^2])/(14*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[
c*x]))/(7*d*x^7) - (b*c^7*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(7*Sqrt[1 - c^2*x
^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
```

```
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^8}\,dx = -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^{3}}{x^7}}{7\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\right.}{14\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7dx^7}+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\right.}{14\sqrt{1}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}}-\frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}}-$$

Mathematica [A]
time = 0.14, size = 156, normalized size = 0.77

$$\frac{d^2\sqrt{d-c^2dx^2}\left(60a\left(-1+c^2x^2\right)^4+bcx\sqrt{1-c^2x^2}\left(10-45c^2x^2+90c^4x^4-147c^6x^6\right)+60b\left(-1+c^2x^2\right)^4\mathrm{ArcSin}(cx)\right)}{420x^7\left(-1+c^2x^2\right)}-\frac{bc^7d^2\sqrt{d-c^2dx^2}\,\log(x)}{7\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(60*a*(-1 + c^2*x^2)^4 + b*c*x*Sqrt[1 - c^2*x^2]*(
10 - 45*c^2*x^2 + 90*c^4*x^4 - 147*c^6*x^6) + 60*b*(-1 + c^2*x^2)^4*ArcSin[
c*x]))/(420*x^7*(-1 + c^2*x^2)) - (b*c^7*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(7
*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.40, size = 4031, normalized size = 19.86

method	result	size
default	Expression too large to display	4031

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x,method=_RETURNVERBOSE)
```

[Out] -55/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35
*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7+1/7*b*(
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)
^(1/2))^2-1)*d^2*c^7+1/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*
x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^7/(c^2*x^2-1)*arcsin(c
*x)-21/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-
35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^15+
b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^
6+21*c^4*x^4-7*c^2*x^2+1)*x^13/(c^2*x^2-1)*arcsin(c*x)*c^20-7*b*(-d*(c^2*x^
2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-
7*c^2*x^2+1)*x^11/(c^2*x^2-1)*arcsin(c*x)*c^18+3/2*b*(-d*(c^2*x^2-1))^(1/2)
*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1
)*x^10/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^17+23*b*(-d*(c^2*x^2-1))^(1/2)*d^2/
(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9
/(c^2*x^2-1)*arcsin(c*x)*c^16-47*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-
21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(c^2*x^2-1)*
arcsin(c*x)*c^14+119/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x
^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^6/(c^2*x^2-1)*(-c^2*x^2
+1)^(1/2)*c^13+66*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35
*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^1
2-47/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35
*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-66
b(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x
^6+21*c^4*x^4-7*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^10+109/12*b*(-d*(c
^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4
*x^4-7*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9+330/7*b*(-d*(c^2*x
^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4
-7*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^8-165/7*b*(-d*(c^2*x^2-1))^(1/2)*
d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)
/x/(c^2*x^2-1)*arcsin(c*x)*c^6+41/28*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x
^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^2/(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)*c^5+55/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-2
1*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^3/(c^2*x^2-1)*a
rcsin(c*x)*c^4-23/84*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10
+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)
^(1/2)*c^3-11/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c
^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+1
/42*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^
6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-3/14*I*b
(-d(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6
+21*c^4*x^4-7*c^2*x^2+1)*x^13/(c^2*x^2-1)*c^20+27/28*I*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x
^2+1)*x^11/(c^2*x^2-1)*c^18-73/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^
12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9/(c^2*x^2-
1)*c^16+67/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c

```
^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(c^2*x^2-1)*c^14-11/14*I*b*(-
d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21
*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^12+17/84*I*b*(-d*(c^2*x^2-1))^(1/2)
*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1
)*x^3/(c^2*x^2-1)*c^10-1/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*
c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x/(c^2*x^2-1)*c^8-2
*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*d^2*c^7/(7*c^2*x
^2-7)-1/7*a/d/x^7*(-c^2*d*x^2+d)^(7/2)-83/84*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2
/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^
7/(c^2*x^2-1)*(-c^2*x^2+1)*c^14+17/28*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^1
2*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*
x^2-1)*(-c^2*x^2+1)*c^12-5/28*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-2
1*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^3/(c^2*x^2-1)*(
-c^2*x^2+1)*c^10+1/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x
^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1
)*c^8+1/7*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x
^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin
(c*x)*c^7-3/14*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*
c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^
18+3/4*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-
35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9/(c^2*x^2-1)*(-c^2*x^2+1)*c^16+I*b*(-
d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x...
```

Maxima [A]
time = 0.51, size = 205, normalized size = 1.01

$$\frac{\left(6\,(-1)^{-2\,c^2dx^2+2\,d}\,c^6d^{\frac{7}{2}}\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+6\,c^6d^{\frac{7}{2}}\log\left(x^2-\frac{1}{c^2}\right)-\frac{11\,\sqrt{c^4dx^4-2\,c^2dx^2+d}\,c^4d^3}{x^2}+\frac{7\,\sqrt{c^4dx^4-2\,c^2dx^2+d}\,c^2d^3}{x^4}-\frac{2\,\sqrt{c^4dx^4-2\,c^2dx^2+d}\,d^3}{x^6}\right)bc}{84\,d}-\frac{(-c^2dx^2+d)^{\frac{7}{2}}b\arcsin(cx)}{7\,dx^7}-\frac{(-c^2dx^2+d)^{\frac{7}{2}}a}{7\,dx^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] 1/84*(6*(-1)^(-2*c^2*d*x^2 + 2*d)*c^6*d^(7/2)*log(-2*c^2*d + 2*d/x^2) + 6*c
^6*d^(7/2)*log(x^2 - 1/c^2) - 11*sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*c^4*d^3/
x^2 + 7*sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*c^2*d^3/x^4 - 2*sqrt(c^4*d*x^4 -
2*c^2*d*x^2 + d)*d^3/x^6)*b*c/d - 1/7*(-c^2*d*x^2 + d)^(7/2)*b*arcsin(c*x)/
(d*x^7) - 1/7*(-c^2*d*x^2 + d)^(7/2)*a/(d*x^7)
```

Fricas [A]
time = 3.90, size = 655, normalized size = 3.23

$$\left[\frac{6\,(bc^9d^2x^9-bc^7d^2x^7)\sqrt{d}\,\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)+(18\,bc^5d^2x^5-(18\,bc^5-9\,bc^3+2\,bc)d^2x^7-9\,bc^3d^2x^3+2\,bcd^2x)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+12\,(ac^8d^2x^8-4\,ac^6d^2x^6+6\,ac^4d^2x^4-4\,ac^2d^2x^2+ad^2+(bc^8d^2x^8-4\,bc^6d^2x^6+6\,bc^4d^2x^4-4\,bc^2d^2x^2+bd^2)\arcsin(cx))\sqrt{-c^2dx^2+d}}{84\,(c^2x^9-x^7)},\ -\frac{12\,(bc^9d^2x^9-bc^7d^2x^7)\sqrt{-d}\,\arctan\left(\frac{\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)-(18\,bc^5d^2x^5-(18\,bc^5-9\,bc^3+2\,bc)d^2x^7-9\,bc^3d^2x^3+2\,bcd^2x)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}-12\,(ac^8d^2x^8-4\,ac^6d^2x^6+6\,ac^4d^2x^4-4\,ac^2d^2x^2+ad^2+(bc^8d^2x^8-4\,bc^6d^2x^6+6\,bc^4d^2x^4-4\,bc^2d^2x^2+bd^2)\arcsin(cx))\sqrt{-c^2dx^2+d}}{84\,(c^2x^9-x^7)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/84*(6*(b*c^9*d^2*x^9 - b*c^7*d^2*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2
 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(
c^2*x^4 - x^2)) + (18*b*c^5*d^2*x^5 - (18*b*c^5 - 9*b*c^3 + 2*b*c)*d^2*x^7
- 9*b*c^3*d^2*x^3 + 2*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) +
12*(a*c^8*d^2*x^8 - 4*a*c^6*d^2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a
*d^2 + (b*c^8*d^2*x^8 - 4*b*c^6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2
 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7), -1/84*(12*(b*
c^9*d^2*x^9 - b*c^7*d^2*x^7)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2
*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) - (18*b*c^5
*d^2*x^5 - (18*b*c^5 - 9*b*c^3 + 2*b*c)*d^2*x^7 - 9*b*c^3*d^2*x^3 + 2*b*c*d
^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 12*(a*c^8*d^2*x^8 - 4*a*c^6
*d^2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a*d^2 + (b*c^8*d^2*x^8 - 4*b
*c^6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Timed out
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^8,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^8, x)
```

3.91 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))}{x^{10}}\,dx$

Optimal. Leaf size=282

$$-\frac{bc^3d^2\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}}+\frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}}-\frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}}-\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8}-\frac{(d-c^2dx^2)^7}{}$$

```
[Out] -1/9*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/d/x^9-2/63*c^2*(-c^2*d*x^2+d)^(
7/2)*(a+b*arcsin(c*x))/d/x^7-1/72*b*c*d^2*(-c^2*x^2+1)^(7/2)*(-c^2*d*x^2+d)
^(1/2)/x^8-1/189*b*c^3*d^2*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+1/42
*b*c^5*d^2*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-1/21*b*c^7*d^2*(-c^2
*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-2/63*b*c^9*d^2*ln(x)*(-c^2*d*x^2+d)^
(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {277, 270, 4779, 12, 457, 79, 45}

$$-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{9dx^9}-\frac{2c^2(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{63dx^7}-\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8}-\frac{2bc^9d^2\log(x)\sqrt{d-c^2dx^2}}{63\sqrt{1-c^2x^2}}-\frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}}+\frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}}-\frac{bc^3d^2\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -1/189*(b*c^3*d^2*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (b*c^5*d^2
*Sqrt[d - c^2*d*x^2])/(42*x^4*Sqrt[1 - c^2*x^2]) - (b*c^7*d^2*Sqrt[d - c^2*
d*x^2])/(21*x^2*Sqrt[1 - c^2*x^2]) - (b*c*d^2*(1 - c^2*x^2)^(7/2)*Sqrt[d -
c^2*d*x^2])/(72*x^8) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(9*d*x^9
) - (2*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (2*b*c^9
*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(63*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^{10}}\,dx = -\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{(-7-2c^2x^2)(1-c^2x^2)^3}{63x^9}\,dx}{\sqrt{1-c^2x^2}} + (a+b\sin^{-1}(cx))\ \int$$

$$= -\frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{9dx^9} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{(-7-2c^2x}{}}{63\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{9dx^9} - \frac{2c^2(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(}{63dx^7}$$

$$= -\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} - \frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{9dx^9}$$

$$= -\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} - \frac{(d-c^2dx^2)^{7/2}(a+b\sin^{-1}(cx))}{9dx^9}$$

$$= -\frac{bc^3d^2\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}} + \frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}} - \frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}} - b$$

Mathematica [A]
time = 0.15, size = 184, normalized size = 0.65

$$\frac{d^2\sqrt{d-c^2dx^2}\left(840a(-1+c^2x^2)^4(7+2c^2x^2)+bcx\sqrt{1-c^2x^2}(735-2660c^2x^2+3150c^4x^4-420c^6x^6-4566c^8x^8)+840b(-1+c^2x^2)^4(7+2c^2x^2)\,\mathrm{ArcSin}(cx)\right)}{52920x^9(-1+c^2x^2)} - \frac{2bc^9d^2\sqrt{d-c^2dx^2}\log(x)}{63\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(840*a*(-1 + c^2*x^2)^4*(7 + 2*c^2*x^2) + b*c*x*Sq
rt[1 - c^2*x^2]*(735 - 2660*c^2*x^2 + 3150*c^4*x^4 - 420*c^6*x^6 - 4566*c^8
*x^8) + 840*b*(-1 + c^2*x^2)^4*(7 + 2*c^2*x^2)*ArcSin[c*x]))/(52920*x^9*(-1
 + c^2*x^2)) - (2*b*c^9*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(63*Sqrt[1 - c^2*x^
2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.47, size = 5324, normalized size = 18.88

method	result	size
default	Expression too large to display	5324

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Maxima [A]
time = 0.50, size = 162, normalized size = 0.57

$$-\frac{1}{1512}\left(48\,c^{8}d^{\frac{5}{2}}\log\left(x\right)-\frac{12\,c^{6}d^{\frac{5}{2}}x^{6}-90\,c^{4}d^{\frac{5}{2}}x^{4}+76\,c^{2}d^{\frac{5}{2}}x^{2}-21\,d^{\frac{5}{2}}}{x^{8}}\right)bc-\frac{1}{63}\,b\left(\frac{2\left(-c^{2}dx^{2}+d\right)^{\frac{7}{2}}c^{2}}{dx^{7}}+\frac{7\left(-c^{2}dx^{2}+d\right)^{\frac{7}{2}}}{dx^{9}}\right)\arcsin\left(cx\right)-\frac{1}{63}\,a\left(\frac{2\left(-c^{2}dx^{2}+d\right)^{\frac{7}{2}}c^{2}}{dx^{7}}+\frac{7\left(-c^{2}dx^{2}+d\right)^{\frac{7}{2}}}{dx^{9}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="maxima"
)
```

```
[Out] -1/1512*(48*c^8*d^(5/2)*log(x) - (12*c^6*d^(5/2)*x^6 - 90*c^4*d^(5/2)*x^4 +
 76*c^2*d^(5/2)*x^2 - 21*d^(5/2))/x^8)*b*c - 1/63*b*(2*(-c^2*d*x^2 + d)^(7/
2)*c^2/(d*x^7) + 7*(-c^2*d*x^2 + d)^(7/2)/(d*x^9))*arcsin(c*x) - 1/63*a*(2*
(-c^2*d*x^2 + d)^(7/2)*c^2/(d*x^7) + 7*(-c^2*d*x^2 + d)^(7/2)/(d*x^9))
```

Fricas [A]
time = 2.90, size = 747, normalized size = 2.65

$$\left[\frac{24\left(bc^{11}d^{2}x^{11}-bc^{9}d^{2}x^{9}\right)\sqrt{d}\log\left(\frac{c^{2}dx^{6}+c^{2}dx^{2}-dx^{4}+\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}\left(x^{4}-1\right)\sqrt{d}-d}{c^{2}x^{4}-x^{2}}\right)-\left(12\,bc^{7}d^{2}x^{7}-90\,bc^{5}d^{2}x^{5}-\left(12\,bc^{7}-90\,bc^{5}+76\,bc^{3}-21\,bc\right)d^{2}x^{9}+76\,bc^{3}d^{2}x^{3}-21\,bcd^{2}x\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}+24\left(2\,ac^{10}d^{2}x^{10}-ac^{8}d^{2}x^{8}-16\,ac^{6}d^{2}x^{6}+34\,ac^{4}d^{2}x^{4}-26\,ac^{2}d^{2}x^{2}+7\,ad^{2}+\left(2\,bc^{10}d^{2}x^{10}-bc^{8}d^{2}x^{8}-16\,bc^{6}d^{2}x^{6}+34\,bc^{4}d^{2}x^{4}-26\,bc^{2}d^{2}x^{2}+7\,bd^{2}\right)\arcsin\left(cx\right)\right)\sqrt{-c^{2}dx^{2}+d}}{1512\left(c^{2}x^{11}-x^{9}\right)},\ -\frac{48\left(bc^{11}d^{2}x^{11}-bc^{9}d^{2}x^{9}\right)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}\left(x^{2}+1\right)\sqrt{-d}}{c^{2}dx^{4}-\left(c^{2}+1\right)dx^{2}+d}\right)+\left(12\,bc^{7}d^{2}x^{7}-90\,bc^{5}d^{2}x^{5}-\left(12\,bc^{7}-90\,bc^{5}+76\,bc^{3}-21\,bc\right)d^{2}x^{9}+76\,bc^{3}d^{2}x^{3}-21\,bcd^{2}x\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}-24\left(2\,ac^{10}d^{2}x^{10}-ac^{8}d^{2}x^{8}-16\,ac^{6}d^{2}x^{6}+34\,ac^{4}d^{2}x^{4}-26\,ac^{2}d^{2}x^{2}+7\,ad^{2}+\left(2\,bc^{10}d^{2}x^{10}-bc^{8}d^{2}x^{8}-16\,bc^{6}d^{2}x^{6}+34\,bc^{4}d^{2}x^{4}-26\,bc^{2}d^{2}x^{2}+7\,bd^{2}\right)\arcsin\left(cx\right)\right)\sqrt{-c^{2}dx^{2}+d}}{1512\left(c^{2}x^{11}-x^{9}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="fricas"
)
```

```
[Out] [1/1512*(24*(b*c^11*d^2*x^11 - b*c^9*d^2*x^9)*sqrt(d)*log((c^2*d*x^6 + c^2*
d*x^2 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) -
 d)/(c^2*x^4 - x^2)) - (12*b*c^7*d^2*x^7 - 90*b*c^5*d^2*x^5 - (12*b*c^7 - 9
0*b*c^5 + 76*b*c^3 - 21*b*c)*d^2*x^9 + 76*b*c^3*d^2*x^3 - 21*b*c*d^2*x)*sqr
t(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 24*(2*a*c^10*d^2*x^10 - a*c^8*d^2*x^
8 - 16*a*c^6*d^2*x^6 + 34*a*c^4*d^2*x^4 - 26*a*c^2*d^2*x^2 + 7*a*d^2 + (2*b
*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 16*b*c^6*d^2*x^6 + 34*b*c^4*d^2*x^4 - 26*b
*c^2*d^2*x^2 + 7*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)
, -1/1512*(48*(b*c^11*d^2*x^11 - b*c^9*d^2*x^9)*sqrt(-d)*arctan(sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^
2 + d)) + (12*b*c^7*d^2*x^7 - 90*b*c^5*d^2*x^5 - (12*b*c^7 - 90*b*c^5 + 76*
b*c^3 - 21*b*c)*d^2*x^9 + 76*b*c^3*d^2*x^3 - 21*b*c*d^2*x)*sqrt(-c^2*d*x^2
+ d)*sqrt(-c^2*x^2 + 1) - 24*(2*a*c^10*d^2*x^10 - a*c^8*d^2*x^8 - 16*a*c^6*
d^2*x^6 + 34*a*c^4*d^2*x^4 - 26*a*c^2*d^2*x^2 + 7*a*d^2 + (2*b*c^10*d^2*x^1
0 - b*c^8*d^2*x^8 - 16*b*c^6*d^2*x^6 + 34*b*c^4*d^2*x^4 - 26*b*c^2*d^2*x^2
+ 7*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)]
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**10,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3877 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^10,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^10, x)
```

3.92 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}{x^{12}} \, dx$

Optimal. Leaf size=361

$$-\frac{bcd^2\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}}+\frac{23bc^3d^2\sqrt{d-c^2dx^2}}{792x^8\sqrt{1-c^2x^2}}-\frac{113bc^5d^2\sqrt{d-c^2dx^2}}{4158x^6\sqrt{1-c^2x^2}}+\frac{bc^7d^2\sqrt{d-c^2dx^2}}{924x^4\sqrt{1-c^2x^2}}+\frac{2bc^9d^2\sqrt{d-c^2dx^2}}{693x^2\sqrt{1-c^2x^2}}$$

```
[Out] -1/11*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/d/x^11-4/99*c^2*(-c^2*d*x^2+d)
^(7/2)*(a+b*arcsin(c*x))/d/x^9-8/693*c^4*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c
*x))/d/x^7-1/110*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^10/(-c^2*x^2+1)^(1/2)+23/79
2*b*c^3*d^2*(-c^2*d*x^2+d)^(1/2)/x^8/(-c^2*x^2+1)^(1/2)-113/4158*b*c^5*d^2*
(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+1/924*b*c^7*d^2*(-c^2*d*x^2+d)^
(1/2)/x^4/(-c^2*x^2+1)^(1/2)+2/693*b*c^9*d^2*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2
*x^2+1)^(1/2)-8/693*b*c^11*d^2*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2
)
```

Rubi [A]
time = 0.14, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {277, 270, 4779, 12, 1265, 907}

$$-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{11dx^{11}}-\frac{4c^2(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{99dx^9}-\frac{8c^4(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{693dx^7}-\frac{bcd^2\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}}-\frac{8bc^{11}d^2\log(x)\sqrt{d-c^2dx^2}}{693\sqrt{1-c^2x^2}}+\frac{2bc^9d^2\sqrt{d-c^2dx^2}}{693x^2\sqrt{1-c^2x^2}}+\frac{bc^7d^2\sqrt{d-c^2dx^2}}{924x^4\sqrt{1-c^2x^2}}-\frac{113bc^5d^2\sqrt{d-c^2dx^2}}{4158x^6\sqrt{1-c^2x^2}}+\frac{23bc^3d^2\sqrt{d-c^2dx^2}}{792x^8\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] -1/110*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^10*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d
^2*Sqrt[d - c^2*d*x^2])/(792*x^8*Sqrt[1 - c^2*x^2]) - (113*b*c^5*d^2*Sqrt[d
 - c^2*d*x^2])/(4158*x^6*Sqrt[1 - c^2*x^2]) + (b*c^7*d^2*Sqrt[d - c^2*d*x^2
])/(924*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^9*d^2*Sqrt[d - c^2*d*x^2])/(693*x^2
*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(11*d*x^1
1) - (4*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(99*d*x^9) - (8*c^4*
(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(693*d*x^7) - (8*b*c^11*d^2*Sqrt
[d - c^2*d*x^2]*Log[x])/(693*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{x^{12}}\,dx = -\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^3\left(-63-28c^2x^2-8c^4x^4\right)}{693x^{11}}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin^{-1}(\right.$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{\left(1-c^2x^2\right)^3(}{}}{693\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{4c^2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(c\right.}{99dx^9}$$

$$= -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{11dx^{11}} - \frac{4c^2\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(c\right.}{99dx^9}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} + \frac{23bc^3d^2\sqrt{d-c^2dx^2}}{792x^8\sqrt{1-c^2x^2}} - \frac{113bc^5d^2\sqrt{d-c^2dx^2}}{4158x^6\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.16, size = 209, normalized size = 0.58

$$\frac{d^2\sqrt{d-c^2dx^2}\left(2520a\left(-1+c^2x^2\right)^4\left(63+28c^2x^2+8c^4x^4\right)-bcx\sqrt{1-c^2x^2}\left(-15876+50715c^2x^2-47460c^4x^4+1890c^6x^6+5040c^8x^8+59048c^{10}x^{10}\right)+2520b\left(-1+c^2x^2\right)^4\left(63+28c^2x^2+8c^4x^4\right)\text{ArcSin}(cx)\right)}{1746360x^{11}\left(-1+c^2x^2\right)} - \frac{8bc^{11}d^2\sqrt{d-c^2dx^2}\log(x)}{693\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(2520*a*(-1 + c^2*x^2)^4*(63 + 28*c^2*x^2 + 8*c^4*
x^4) - b*c*x*Sqrt[1 - c^2*x^2]*(-15876 + 50715*c^2*x^2 - 47460*c^4*x^4 + 18
90*c^6*x^6 + 5040*c^8*x^8 + 59048*c^10*x^10) + 2520*b*(-1 + c^2*x^2)^4*(63
+ 28*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]))/(1746360*x^11*(-1 + c^2*x^2)) - (8*
b*c^11*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(693*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.62, size = 6761, normalized size = 18.73

method	result	size
default	Expression too large to display	6761

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Maxima [A]
time = 0.51, size = 221, normalized size = 0.61

$$-\frac{1}{83160}\left(960\,c^{10}d^{\frac{5}{2}}\log\left(x\right)-\frac{240\,c^8d^{\frac{5}{2}}x^8+90\,c^6d^{\frac{5}{2}}x^6-2260\,c^4d^{\frac{5}{2}}x^4+2415\,c^2d^{\frac{5}{2}}x^2-756\,d^{\frac{5}{2}}}{x^{10}}\right)bc-\frac{1}{693}\,b\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{7}{2}}c^4}{dx^7}+\frac{28\left(-c^2dx^2+d\right)^{\frac{7}{2}}c^2}{dx^9}+\frac{63\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{dx^{11}}\right)\arcsin\left(cx\right)-\frac{1}{693}\,a\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{7}{2}}c^4}{dx^7}+\frac{28\left(-c^2dx^2+d\right)^{\frac{7}{2}}c^2}{dx^9}+\frac{63\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{dx^{11}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="maxima"
)
```

```
[Out] -1/83160*(960*c^10*d^(5/2)*log(x) - (240*c^8*d^(5/2)*x^8 + 90*c^6*d^(5/2)*x
^6 - 2260*c^4*d^(5/2)*x^4 + 2415*c^2*d^(5/2)*x^2 - 756*d^(5/2))/x^10)*b*c -
 1/693*b*(8*(-c^2*d*x^2 + d)^(7/2)*c^4/(d*x^7) + 28*(-c^2*d*x^2 + d)^(7/2)*
c^2/(d*x^9) + 63*(-c^2*d*x^2 + d)^(7/2)/(d*x^11))*arcsin(c*x) - 1/693*a*(8*
(-c^2*d*x^2 + d)^(7/2)*c^4/(d*x^7) + 28*(-c^2*d*x^2 + d)^(7/2)*c^2/(d*x^9)
+ 63*(-c^2*d*x^2 + d)^(7/2)/(d*x^11))
```

Fricas [A]
time = 2.58, size = 831, normalized size = 2.30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="fricas"
)
```

```
[Out] [1/83160*(480*(b*c^13*d^2*x^13 - b*c^11*d^2*x^11)*sqrt(d)*log((c^2*d*x^6 +
c^2*d*x^2 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(
d) - d)/(c^2*x^4 - x^2)) - (240*b*c^9*d^2*x^9 + 90*b*c^7*d^2*x^7 - (240*b*c
^9 + 90*b*c^7 - 2260*b*c^5 + 2415*b*c^3 - 756*b*c)*d^2*x^11 - 2260*b*c^5*d^
2*x^5 + 2415*b*c^3*d^2*x^3 - 756*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*
x^2 + 1) + 120*(8*a*c^12*d^2*x^12 - 4*a*c^10*d^2*x^10 - a*c^8*d^2*x^8 - 116
*a*c^6*d^2*x^6 + 274*a*c^4*d^2*x^4 - 224*a*c^2*d^2*x^2 + 63*a*d^2 + (8*b*c^
12*d^2*x^12 - 4*b*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 116*b*c^6*d^2*x^6 + 274*b
*c^4*d^2*x^4 - 224*b*c^2*d^2*x^2 + 63*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 +
 d))/(c^2*x^13 - x^11), -1/83160*(960*(b*c^13*d^2*x^13 - b*c^11*d^2*x^11)*s
qrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(
c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (240*b*c^9*d^2*x^9 + 90*b*c^7*d^2*x^7 -
 (240*b*c^9 + 90*b*c^7 - 2260*b*c^5 + 2415*b*c^3 - 756*b*c)*d^2*x^11 - 2260
*b*c^5*d^2*x^5 + 2415*b*c^3*d^2*x^3 - 756*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*s
qrt(-c^2*x^2 + 1) - 120*(8*a*c^12*d^2*x^12 - 4*a*c^10*d^2*x^10 - a*c^8*d^2*
x^8 - 116*a*c^6*d^2*x^6 + 274*a*c^4*d^2*x^4 - 224*a*c^2*d^2*x^2 + 63*a*d^2
+ (8*b*c^12*d^2*x^12 - 4*b*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 116*b*c^6*d^2*x^
6 + 274*b*c^4*d^2*x^4 - 224*b*c^2*d^2*x^2 + 63*b*d^2)*arcsin(c*x))*sqrt(-c^
2*d*x^2 + d))/(c^2*x^13 - x^11)]
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**12,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 5986 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^12,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^12, x)
```

3.93 $\int x^5(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=354

$$\frac{8bd^2x\sqrt{d-c^2dx^2}}{693c^5\sqrt{1-c^2x^2}}+\frac{4bd^2x^3\sqrt{d-c^2dx^2}}{2079c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^5\sqrt{d-c^2dx^2}}{1155c\sqrt{1-c^2x^2}}-\frac{113bcd^2x^7\sqrt{d-c^2dx^2}}{4851\sqrt{1-c^2x^2}}+\frac{23bc^3d^2x^9\sqrt{d-c^2d}}{891\sqrt{1-c^2x^2}}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^6/d+2/9*(-c^2*d*x^2+d)^(9/2)*
(a+b*arcsin(c*x))/c^6/d^2-1/11*(-c^2*d*x^2+d)^(11/2)*(a+b*arcsin(c*x))/c^6/
d^3+8/693*b*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^5/(-c^2*x^2+1)^(1/2)+4/2079*b*d^2*
x^3*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/1155*b*d^2*x^5*(-c^2*d*x^
2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-113/4851*b*c*d^2*x^7*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+23/891*b*c^3*d^2*x^9*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)-1/121*b*c^5*d^2*x^11*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 354, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}=0.185$, Rules used = {272, 45, 4779, 12, 1167}

$$-\frac{(d-c^2dx^2)^{11/2}(a+b\text{ArcSin}(cx))}{11c^6d^3}+\frac{2(d-c^2dx^2)^{9/2}(a+b\text{ArcSin}(cx))}{9c^6d^2}-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{7c^6d}-\frac{113bcd^2x^7\sqrt{d-c^2dx^2}}{4851\sqrt{1-c^2x^2}}+\frac{bd^2x^5\sqrt{d-c^2dx^2}}{1155c\sqrt{1-c^2x^2}}+\frac{8bd^2x\sqrt{d-c^2dx^2}}{693c^5\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}}+\frac{23bc^3d^2x^9\sqrt{d-c^2dx^2}}{891\sqrt{1-c^2x^2}}+\frac{4bd^2x^3\sqrt{d-c^2dx^2}}{2079c^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*x*Sqrt[d - c^2*d*x^2])/(693*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d^2*x^3*
Sqrt[d - c^2*d*x^2])/(2079*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^5*Sqrt[d - c^2
*d*x^2])/(1155*c*Sqrt[1 - c^2*x^2]) - (113*b*c*d^2*x^7*Sqrt[d - c^2*d*x^2])
/(4851*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d^2*x^9*Sqrt[d - c^2*d*x^2])/(891*Sqr
t[1 - c^2*x^2]) - (b*c^5*d^2*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d) + (2*(d - c^2*d
*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^6*d^2) - ((d - c^2*d*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(11*c^6*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int x^5\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx = -\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^3\left(-8-28c^2x^2-63c^4x^4\right)}{693c^6}\,dx}{\sqrt{1-c^2x^2}} + \left(a+b\sin\right.$$

$$= -\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^3\left(-8-28c^2x^2-63c^4x^4\right)\,dx}{693c^5\sqrt{1-c^2x^2}} +$$

$$= -\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(-8-4c^2x^2-3c^4x^4+113c^6x^6-161c^8x^8\right.}{693c^5\sqrt{1-c^2x^2}}$$

$$= \frac{8bd^2x\sqrt{d-c^2dx^2}}{693c^5\sqrt{1-c^2x^2}} + \frac{4bd^2x^3\sqrt{d-c^2dx^2}}{2079c^3\sqrt{1-c^2x^2}} + \frac{bd^2x^5\sqrt{d-c^2dx^2}}{1155c\sqrt{1-c^2x^2}} -$$

Mathematica [A]
time = 0.13, size = 160, normalized size = 0.45

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(3465a(1-c^2x^2)^{7/2}(8+28c^2x^2+63c^4x^4)+bcx(-27720-4620c^2x^2-2079c^4x^4+55935c^6x^6-61985c^8x^8+19845c^{10}x^{10})+3465b(1-c^2x^2)^{7/2}(8+28c^2x^2+63c^4x^4)\text{ArcSin}(cx)\right)}{2401245c^6\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/2401245*(d^2*Sqrt[d - c^2*d*x^2]*(3465*a*(1 - c^2*x^2)^(7/2)*(8 + 28*c^2
*x^2 + 63*c^4*x^4) + b*c*x*(-27720 - 4620*c^2*x^2 - 2079*c^4*x^4 + 55935*c^
6*x^6 - 61985*c^8*x^8 + 19845*c^10*x^10) + 3465*b*(1 - c^2*x^2)^(7/2)*(8 +
28*c^2*x^2 + 63*c^4*x^4)*ArcSin[c*x]))/(c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.42, size = 1644, normalized size = 4.64

method	result	size
default	Expression too large to display	1644

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/11*x^4*(-c^2*d*x^2+d)^(7/2)/c^2/d+4/11/c^2*(-1/9*x^2*(-c^2*d*x^2+d)^(
7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2)))+b*(1/247808*(-d*(c^2*x^2-1))^(
1/2)*(1+1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2816*I*(-c^2*x^2+1)^(1/2)*x^7*c^7
-3328*c^10*x^10-1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+1024*c^12*x^12-220*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3-2352*c^6*x^6+4096*c^8*x^8-61*c^2*x^2+2816*I*(-c^2*
x^2+1)^(1/2)*x^9*c^9+11*I*(-c^2*x^2+1)^(1/2)*x*c+620*c^4*x^4)*(I+11*arcsin(
c*x))*d^2/c^6/(c^2*x^2-1)-1/165888*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-70
4*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(
1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*
d^2/c^6/(c^2*x^2-1)-5/100352*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6
-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c
^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)
*(I+7*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+5/9216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4
*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)
*(I+3*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)-5/1024*(-d*(c^2*x^2-1))^(1/2)*(c^2*x
^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^6/(c^2*x^2-1)-5/1024*(
-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*
d^2/c^6/(c^2*x^2-1)+5/9216*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x
^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))
*d^2/c^6/(c^2*x^2-1)+1/10240*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2
)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x
^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)-1/1658
88*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-5
76*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^
5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)
^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+1/247808*(-
d*(c^2*x^2-1))^(1/2)*(1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+1024*c^12*x^12-28
16*I*(-c^2*x^2+1)^(1/2)*x^9*c^9-3328*c^10*x^10+2816*I*(-c^2*x^2+1)^(1/2)*x^
7*c^7+4096*c^8*x^8-1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2352*c^6*x^6+220*I*(-c
^2*x^2+1)^(1/2)*x^3*c^3+620*c^4*x^4-11*I*(-c^2*x^2+1)^(1/2)*x*c-61*c^2*x^2+
```

```
1)*(-I+11*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+3/125440*(-d*(c^2*x^2-1))^(1/2)*
(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(2*I+35*arcsin(c*x))*cos(6*arcsin(c*x)
)*d^2/c^6/(c^2*x^2-1)+1/250880*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*
x^2+1)^(1/2)-I)*(37*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2/c^6/(c^2*x^2-1
))
```

Maxima [A]
time = 0.50, size = 219, normalized size = 0.62

$$-\frac{1}{693}\left(\frac{63\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^4}{c^2d}+\frac{28\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^6d}\right)b\arcsin\left(cx\right)-\frac{1}{693}\left(\frac{63\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^4}{c^2d}+\frac{28\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^6d}\right)a-\frac{\left(19845\,c^{10}d^{\frac{5}{2}}x^{11}-61985\,c^8d^{\frac{5}{2}}x^9+55935\,c^6d^{\frac{5}{2}}x^7-2079\,c^4d^{\frac{5}{2}}x^5-4620\,c^2d^{\frac{5}{2}}x^3-27720\,d^{\frac{5}{2}}x\right)b}{2401245\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/693*(63*(-c^2*d*x^2 + d)^(7/2)*x^4/(c^2*d) + 28*(-c^2*d*x^2 + d)^(7/2)*x
^2/(c^4*d) + 8*(-c^2*d*x^2 + d)^(7/2)/(c^6*d))*b*arcsin(c*x) - 1/693*(63*(-
c^2*d*x^2 + d)^(7/2)*x^4/(c^2*d) + 28*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^4*d) +
8*(-c^2*d*x^2 + d)^(7/2)/(c^6*d))*a - 1/2401245*(19845*c^10*d^(5/2)*x^11 -
61985*c^8*d^(5/2)*x^9 + 55935*c^6*d^(5/2)*x^7 - 2079*c^4*d^(5/2)*x^5 - 4620
*c^2*d^(5/2)*x^3 - 27720*d^(5/2)*x)*b/c^5
```

Fricas [A]
time = 2.15, size = 291, normalized size = 0.82

$$\frac{\left(19845\,bc^{11}d^2x^{11}-61985\,bc^9d^2x^9+55935\,bc^7d^2x^7-2079\,bc^5d^2x^5-4620\,bc^3d^2x^3-27720\,bcd^2x\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+3465\left(63\,ac^{12}d^2x^{12}-224\,ac^{10}d^2x^{10}+274\,ac^8d^2x^8-116\,ac^6d^2x^6-ac^4d^2x^4-4\,ac^2d^2x^2+8\,ad^2+\left(63\,bc^{12}d^2x^{12}-224\,bc^{10}d^2x^{10}+274\,bc^8d^2x^8-116\,bc^6d^2x^6-bc^4d^2x^4-4\,bc^2d^2x^2+8\,bd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{2401245\left(c^8x^2-c^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/2401245*((19845*b*c^11*d^2*x^11 - 61985*b*c^9*d^2*x^9 + 55935*b*c^7*d^2*x
^7 - 2079*b*c^5*d^2*x^5 - 4620*b*c^3*d^2*x^3 - 27720*b*c*d^2*x)*sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3465*(63*a*c^12*d^2*x^12 - 224*a*c^10*d^2*x^
10 + 274*a*c^8*d^2*x^8 - 116*a*c^6*d^2*x^6 - a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^
2 + 8*a*d^2 + (63*b*c^12*d^2*x^12 - 224*b*c^10*d^2*x^10 + 274*b*c^8*d^2*x^8
 - 116*b*c^6*d^2*x^6 - b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + 8*b*d^2)*arcsin(c*
x))*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c^6)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4845 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^5\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.94 $\int x^3(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=278

$$\frac{2bd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}-\frac{bcd^2x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}+\frac{19bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}-$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^4/d+1/9*(-c^2*d*x^2+d)^(9/2)*
(a+b*arcsin(c*x))/c^4/d^2+2/63*b*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1
)^(1/2)+1/189*b*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/21*b*c*
d^2*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+19/441*b*c^3*d^2*x^7*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/81*b*c^5*d^2*x^9*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {272, 45, 4779, 12, 380}

$$\frac{(d-c^2dx^2)^{9/2}(a+b\text{ArcSin}(cx))}{9c^4d^2}-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{7c^4d}-\frac{bcd^2x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}+\frac{bd^2x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}+\frac{2bd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{19bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d^2*x*Sqrt[d - c^2*d*x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^3*Sqr
t[d - c^2*d*x^2])/(189*c*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^5*Sqrt[d - c^2*d*x
^2])/(21*Sqrt[1 - c^2*x^2]) + (19*b*c^3*d^2*x^7*Sqrt[d - c^2*d*x^2])/(441*S
qrt[1 - c^2*x^2]) - (b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d) + ((d - c^2*d*x
^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(-2-7c^2x^2\right)\left(1-c^2x^2\right)^3}{63c^4}\,dx}{\sqrt{1-c^2x^2}}+\left(a+b\sin^{-1}(cx\right.$$

$$=-\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(-2-7c^2x^2\right)\left(1-c^2x^2\right)^3\,dx}{63c^3\sqrt{1-c^2x^2}}+\frac{1}{2}\left(a+b\,\mathrm{s}\right.$$

$$=-\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+15c^4x^4-19c^6x^6+7c^8x^8\right)}{63c^3\sqrt{1-c^2x^2}}$$

$$=\frac{2bd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}-\frac{bcd^2x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.11, size = 137, normalized size = 0.49

$$\frac{d^2\sqrt{d-c^2dx^2}\left(-63a\left(1-c^2x^2\right)^{7/2}\left(2+7c^2x^2\right)+b\left(126cx+21c^3x^3-189c^5x^5+171c^7x^7-49c^9x^9\right)-63b\left(1-c^2x^2\right)^{7/2}\left(2+7c^2x^2\right)\mathrm{ArcSin}(cx)\right)}{3969c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(-63*a*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2) + b*(12
6*c*x + 21*c^3*x^3 - 189*c^5*x^5 + 171*c^7*x^7 - 49*c^9*x^9) - 63*b*(1 - c^
2*x^2)^(7/2)*(2 + 7*c^2*x^2)*ArcSin[c*x]))/(3969*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.28, size = 1063, normalized size = 3.82

method	result
default	$a\left(-\frac{x^{2}\left(-c^{2} d\,x^{2}+d\right)^{\frac{7}{2}}}{9 c^{2} d}-\frac{2\left(-c^{2} d\,x^{2}+d\right)^{\frac{7}{2}}}{63 d\,c^{4}}\right)+b\left(\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(256 c^{10} x^{10}-704 c^{8} x^{8}-256 i\sqrt{-c^{2} x^{2}+1}\,x^{9} c^{9}+\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2))+b*(
1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1
)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-43
2*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-
9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/25088
*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7
*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2
+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^4/(
c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+
1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d^2/c^4/(c
^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)
*(arcsin(c*x)+I)*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^4/(c^2*x^2-1)+1/576*(-d*(
c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1
)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/25088*(-d
*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2
*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x
^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d^2/c^4/(c^2
*x^2-1)+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+25
6*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)
^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I
*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1
))
```

Maxima [A]
time = 0.50, size = 160, normalized size = 0.58

$$-\frac{1}{63}\left(\frac{7\left(-c^{2} d x^{2}+d\right)^{\frac{7}{2}} x^{2}}{c^{2} d}+\frac{2\left(-c^{2} d x^{2}+d\right)^{\frac{7}{2}}}{c^{4} d}\right) b \arcsin\left(c x\right)-\frac{1}{63}\left(\frac{7\left(-c^{2} d x^{2}+d\right)^{\frac{7}{2}} x^{2}}{c^{2} d}+\frac{2\left(-c^{2} d x^{2}+d\right)^{\frac{7}{2}}}{c^{4} d}\right) a-\frac{\left(49\, c^{8} d^{\frac{5}{2}} x^{9}-171\, c^{6} d^{\frac{5}{2}} x^{7}+189\, c^{4} d^{\frac{5}{2}} x^{5}-21\, c^{2} d^{\frac{5}{2}} x^{3}-126\, d^{\frac{5}{2}} x\right) b}{3969\, c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(7/2)/(c^4
*d))*b*arcsin(c*x) - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c^2*d
```

```
*x^2 + d)^(7/2)/(c^4*d))*a - 1/3969*(49*c^8*d^(5/2)*x^9 - 171*c^6*d^(5/2)*x
^7 + 189*c^4*d^(5/2)*x^5 - 21*c^2*d^(5/2)*x^3 - 126*d^(5/2)*x)*b/c^3
```

Fricas [A]
time = 1.68, size = 255, normalized size = 0.92

$$\frac{(49\,bc^9d^2x^9 - 171\,bc^7d^2x^7 + 189\,bc^5d^2x^5 - 21\,bc^3d^2x^3 - 126\,bcd^2x)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1} + 63\,(7\,ac^{10}d^2x^{10} - 26\,ac^8d^2x^8 + 34\,ac^6d^2x^6 - 16\,ac^4d^2x^4 - ac^2d^2x^2 + 2\,ad^2 + (7\,bc^{10}d^2x^{10} - 26\,bc^8d^2x^8 + 34\,bc^6d^2x^6 - 16\,bc^4d^2x^4 - bc^2d^2x^2 + 2\,bd^2)\arcsin(cx))\sqrt{-c^2dx^2+d}}{3969\,(c^6x^2 - c^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3969*((49*b*c^9*d^2*x^9 - 171*b*c^7*d^2*x^7 + 189*b*c^5*d^2*x^5 - 21*b*c^
3*d^2*x^3 - 126*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 63*(7*
a*c^10*d^2*x^10 - 26*a*c^8*d^2*x^8 + 34*a*c^6*d^2*x^6 - 16*a*c^4*d^2*x^4 -
a*c^2*d^2*x^2 + 2*a*d^2 + (7*b*c^10*d^2*x^10 - 26*b*c^8*d^2*x^8 + 34*b*c^6*
d^2*x^6 - 16*b*c^4*d^2*x^4 - b*c^2*d^2*x^2 + 2*b*d^2)*arcsin(c*x))*sqrt(-c^
2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3060 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.95 $\int x(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=202

$$\frac{bd^2x\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}-\frac{bcd^2x^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}+\frac{3bc^3d^2x^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{7/2}(a+b\text{A}}{7c^2d}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^2/d+1/7*b*d^2*x*(-c^2*d*x^2+d
)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/7*b*c*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)+3/35*b*c^3*d^2*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/49*b
*c^5*d^2*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {4767, 200}

$$-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))}{7c^2d}+\frac{bd^2x\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}-\frac{bcd^2x^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}+\frac{3bc^3d^2x^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d^2*x*Sqrt[d - c^2*d*x^2])/(7*c*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^3*Sqrt[d
 - c^2*d*x^2])/(7*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*x^5*Sqrt[d - c^2*d*x^2]
)/(35*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 -
 c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^2*d)
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx=-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^2d}+\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2\right.}{7c\sqrt{1-c^2x^2}}$$

$$=-\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{7c^2d}+\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int\left(1-3c\right.}{7c\sqrt{1-c}}$$

$$=\frac{bd^2x\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}-\frac{bcd^2x^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}+\frac{3bc^3d^2x^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.09, size = 113, normalized size = 0.56

$$\frac{d^2\sqrt{d-c^2dx^2}\left(35a\left(-1+c^2x^2\right)^4+bcx\sqrt{1-c^2x^2}\left(-35+35c^2x^2-21c^4x^4+5c^6x^6\right)+35b\left(-1+c^2x^2\right)^4\text{ArcSin}(cx)\right)}{245c^2\left(-1+c^2x^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(35*a*(-1 + c^2*x^2)^4 + b*c*x*Sqrt[1 - c^2*x^2]*(
-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + 35*b*(-1 + c^2*x^2)^4*ArcSin[c
*x]))/(245*c^2*(-1 + c^2*x^2))
```

Maple [C] Result contains complex when optimal does not.
time = 0.15, size = 717, normalized size = 3.55

method	result
default	$-\frac{a\left(-c^2d\,x^2+d\right)^{\frac{7}{2}}}{7c^2d}+b\left(\frac{\sqrt{-d\left(c^2x^2-1\right)}\left(64c^8x^8-144c^6x^6-64i\sqrt{-c^2x^2+1}\,x^7c^7+104c^4x^4+112i\sqrt{-c^2x^2+1}\right.}{6272c^2\left(c^2x^2-1\right.}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/7*a/c^2/d*(-c^2*d*x^2+d)^(7/2)+b*(1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*
x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2
+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+
1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1)
)^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^2/(c^2*x
^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(ar
csin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+1/128*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^
2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*
arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/7840*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
```

```
+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+70*arcsin(c*x))*cos(6*arcsin(c*x))*d^2/c^2/(
c^2*x^2-1)-3/15680*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)
-I)*(9*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/160*(-d*(
c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(I+5*arcsin(c*x))*co
s(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/320*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*(3*I+5*arcsin(c*x))*sin(4*arcsin(c*x))*d^2/c^2/
(c^2*x^2-1))
```

Maxima [A]
time = 0.49, size = 98, normalized size = 0.49

$$-\frac{\left(-c^{2} d x^{2}+d\right)^{\frac{7}{2}} b \arcsin\left(c x\right)}{7 \, c^{2} d}-\frac{\left(-c^{2} d x^{2}+d\right)^{\frac{7}{2}} a}{7 \, c^{2} d}-\frac{\left(5 \, c^{6} d^{\frac{7}{2}} x^{7}-21 \, c^{4} d^{\frac{7}{2}} x^{5}+35 \, c^{2} d^{\frac{7}{2}} x^{3}-35 \, d^{\frac{7}{2}} x\right) b}{245 \, c d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*(-c^2*d*x^2 + d)^(7/2)*b*arcsin(c*x)/(c^2*d) - 1/7*(-c^2*d*x^2 + d)^(7
/2)*a/(c^2*d) - 1/245*(5*c^6*d^(7/2)*x^7 - 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7
/2)*x^3 - 35*d^(7/2)*x)*b/(c*d)
```

Fricas [A]
time = 1.90, size = 215, normalized size = 1.06

$$\frac{\left(5 \, b c^{7} d^{2} x^{7}-21 \, b c^{5} d^{2} x^{5}+35 \, b c^{3} d^{2} x^{3}-35 \, b c d^{2} x\right) \sqrt{-c^{2} d x^{2}+d} \sqrt{-c^{2} x^{2}+1}+35 \, \left(a c^{8} d^{2} x^{8}-4 \, a c^{6} d^{2} x^{6}+6 \, a c^{4} d^{2} x^{4}-4 \, a c^{2} d^{2} x^{2}+a d^{2}+\left(b c^{8} d^{2} x^{8}-4 \, b c^{6} d^{2} x^{6}+6 \, b c^{4} d^{2} x^{4}-4 \, b c^{2} d^{2} x^{2}+b d^{2}\right) \arcsin\left(c x\right)\right) \sqrt{-c^{2} d x^{2}+d}}{245 \, \left(c^{4} x^{2}-c^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/245*((5*b*c^7*d^2*x^7 - 21*b*c^5*d^2*x^5 + 35*b*c^3*d^2*x^3 - 35*b*c*d^2*
x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 35*(a*c^8*d^2*x^8 - 4*a*c^6*d^
2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a*d^2 + (b*c^8*d^2*x^8 - 4*b*c^
6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.96 $\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\textbf{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=361

$$-\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{3}d$$

```
[Out] 1/3*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*
arcsin(c*x))+d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-23/15*b*c*d^2*x*(-c
^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+11/45*b*c^3*d^2*x^3*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-1/25*b*c^5*d^2*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^
(1/2)-2*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+I*b*d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*d^2*polylog(2,I*c*x+(-c^2*x^2+1)
^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.31, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4787, 4783, 4803, 4268, 2317, 2438, 8, 200}

$$d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{2d^2\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))+\frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))+\frac{ibd^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ibd^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-23*b*c*d^2*x*Sqrt[d - c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2*
x^3*Sqrt[d - c^2*d*x^2])/(45*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^5*Sqrt[d - c
^2*d*x^2])/(25*Sqrt[1 - c^2*x^2]) + d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x]) + (d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 + ((d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x]))/5 - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*d^2*Sqrt[d - c^2*d*x
^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*d^2*Sqrt[d - c
^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)}{x}\,dx = \frac{1}{5}\left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right) + d\int \frac{\left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(\right.}{x}$$

$$= \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right) + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(c\right.$$

$$= -\frac{8bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2d}}{25\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2}}{25\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2}}{25\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2}}{25\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2}}{25\sqrt{1-c^2x^2}}$$

Mathematica [**A**]
time = 1.10, size = 394, normalized size = 1.09

$$\frac{1}{15}ad^2\sqrt{d-c^2dx^2}\left(23-11c^2x^2+3c^4x^4\right)+ad^{5/2}\log(x)-ad^{5/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bd^2\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)+\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)-\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)+i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)-i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}-\frac{bd^2\sqrt{d-c^2dx^2}\left(9cx-3\mathrm{ArcSin}(cx)\left(3\sqrt{1-c^2x^2}+\cos(3\mathrm{ArcSin}(cx))\right)+\sin(3\mathrm{ArcSin}(cx))\right)}{18\sqrt{1-c^2x^2}}+\frac{bd^2\sqrt{d-c^2dx^2}\left(450cx-15\mathrm{ArcSin}(cx)\left(30\sqrt{1-c^2x^2}+5\cos(3\mathrm{ArcSin}(cx))-3\cos(5\mathrm{ArcSin}(cx))\right)+25\sin(3\mathrm{ArcSin}(cx))-9\sin(5\mathrm{ArcSin}(cx))\right)}{3600\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (a*d^2*Sqrt[d - c^2*d*x^2]*(23 - 11*c^2*x^2 + 3*c^4*x^4))/15 + a*d^(5/2)*Lo
g[x] - a*d^(5/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d^2*Sqrt[d - c^2
*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*
ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I
*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b*d
^2*Sqrt[d - c^2*d*x^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*
ArcSin[c*x]]) + Sin[3*ArcSin[c*x]]))/(18*Sqrt[1 - c^2*x^2]) + (b*d^2*Sqrt[d
 - c^2*d*x^2]*(450*c*x - 15*ArcSin[c*x]*(30*Sqrt[1 - c^2*x^2] + 5*Cos[3*Arc
Sin[c*x]] - 3*Cos[5*ArcSin[c*x]]) + 25*Sin[3*ArcSin[c*x]] - 9*Sin[5*ArcSin[
c*x]]))/(3600*Sqrt[1 - c^2*x^2])
```

Maple [**A**]
time = 0.21, size = 652, normalized size = 1.81

method	result
default	$\frac{(-c^2 d\,x^2+d)^{\frac{5}{2}} a}{5}+\frac{a d(-c^2 d\,x^2+d)^{\frac{3}{2}}}{3}-a\,d^{\frac{5}{2}}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2 d\,x^2+d}}{x}\right)+a\sqrt{-c^2 d\,x^2+d}\,d^2-\frac{ib\sqrt{-}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*(-c^2*d*x^2+d)^(5/2)*a+1/3*a*d*(-c^2*d*x^2+d)^(3/2)-a*d^(5/2)*ln((2*d+2
*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a*(-c^2*d*x^2+d)^(1/2)*d^2-I*b*(-d*(c^2*x
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*polylog(2,-I*c*x-(-c^2*x^2+
1)^(1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/25*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)*x^5*c^5-11/45*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-
1)*(-c^2*x^2+1)^(1/2)*x^3*c^3+23/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1
)*(-c^2*x^2+1)^(1/2)*x*c+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x
^2-1)*d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2-1))^(1/
2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(
1/2))+34/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2+1/
5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^6*c^6-14/15*b*(-d*
(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4-23/15*b*(-d*(c^2*x^2
-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) - 1/15*(15*d^(5/
2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - 3*(-c^2*d*x^2
+ d)^(5/2) - 5*(-c^2*d*x^2 + d)^(3/2)*d - 15*sqrt(-c^2*d*x^2 + d)*d^2)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x, x)
```

3.97 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=386

$$-\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))-\frac{5}{6}c^2$$

```
[Out] -5/6*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-1/2*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))/x^2-5/2*c^2*d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/
2*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+7/3*b*c^3*d^2*x*(-c^2*d
*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c^5*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)+5*c^2*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-5/2*I*b*c^2*d^2*polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/2*I*b*c^2*d^
2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)
```

Rubi [A]
time = 0.30, antiderivative size = 386, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4785, 4787, 4783, 4803, 4268, 2317, 2438, 8, 276}

$$-\frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))+\frac{5c^2d^2\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{2x^2}-\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+\frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x*Sqrt[1 - c^2*x^2]) + (7*b*c^3*d^2*x*S
qrt[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^3*Sqrt[d - c^2*d*x
^2])/(9*Sqrt[1 - c^2*x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x]))/2 - (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 - ((d - c^2
*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((5*I
)/2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 -
 c^2*x^2] + (((5*I)/2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin
[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
```

```
IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
```

```
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{2x^2} - \frac{1}{2}(5c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a+}{x}$$

$$= -\frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-}}{2x^2}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}}{6\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} -$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 3.02, size = 484, normalized size = 1.25

$$\frac{-12ad^3(-1+c^2x^2)(-3-14c^2x^2+2c^4x^4) - 180ac^2d^{5/2}x^2\sqrt{d-c^2dx^2}\log(x) + 180ac^2d^{5/2}x^2\sqrt{d-c^2dx^2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + 144bc^2d^3x^2\sqrt{1-c^2x^2}\left(cx-\sqrt{1-c^2x^2}\,\text{ArcSin}(cx) - \text{ArcSin}(cx)\left(\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\log\left(1+e^{i\text{ArcSin}(cx)}\right)\right) - i\left(\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\right)\right) + 2bc^2d^3x^2\sqrt{1-c^2x^2}\left(9cx-3\text{ArcSin}(cx)\left(3\sqrt{1-c^2x^2}+\cos(3\text{ArcSin}(cx))\right)+\sin(3\text{ArcSin}(cx))\right) - 9bc^2d^3x^2\sqrt{1-c^2x^2}\left(2\cot\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\text{ArcSin}(cx)\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)+4\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)-4\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)+4i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-4i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)-\text{ArcSin}(cx)\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)+2\tan\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{72x^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (-12*a*d^3*(-1 + c^2*x^2)*(-3 - 14*c^2*x^2 + 2*c^4*x^4) - 180*a*c^2*d^(5/2)
*x^2*Sqrt[d - c^2*d*x^2]*Log[x] + 180*a*c^2*d^(5/2)*x^2*Sqrt[d - c^2*d*x^2]
*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + 144*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]
*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*
x])] - Log[1 + E^(I*ArcSin[c*x])]) - I*(PolyLog[2, -E^(I*ArcSin[c*x])] - Po
lyLog[2, E^(I*ArcSin[c*x])])) + 2*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]*(9*c*x -
3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin[c*x
]]) - 9*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]*(2*Cot[ArcSin[c*x]/2] + ArcSin[c*x]
*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 4*ArcSin
[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (
4*I)*PolyLog[2, E^(I*ArcSin[c*x])] - ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 2*T
an[ArcSin[c*x]/2]))/(72*x^2*Sqrt[d - c^2*d*x^2])
```

Maple [A]
time = 0.26, size = 704, normalized size = 1.82

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{7}{2}}}{2dx^2}-\frac{ac^2(-c^2dx^2+d)^{\frac{5}{2}}}{2}-\frac{5ac^2d(-c^2dx^2+d)^{\frac{3}{2}}}{6}+\frac{5ac^2d^{\frac{5}{2}}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right)}{2}-5ac^2\sqrt{-}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(7/2)-1/2*a*c^2*(-c^2*d*x^2+d)^(5/2)-5/6*a*c^2*
d*(-c^2*d*x^2+d)^(3/2)+5/2*a*c^2*d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(
1/2))/x)-5/2*a*c^2*(-c^2*d*x^2+d)^(1/2)*d^2+1/9*b*(-d*(c^2*x^2-1))^(1/2)*c^
5*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3-7/3*b*(-d*(c^2*x^2-1))^(1/2)*c^3*d
^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-5*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+
1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+5*I*b*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*polylog(2,-I*
c*x-(-c^2*x^2+1)^(1/2))+11/6*b*(-d*(c^2*x^2-1))^(1/2)*c^2*d^2/(c^2*x^2-1)*a
rcsin(c*x)+1/2*b*d^2*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)*arcsin(c*x)+1/3
*b*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)*x^4-8/3*b*(-d*(c^
2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)*x^2+1/2*b*d^2*(-d*(c^2*x^2-
1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-5*b*(-d*(c^2*x^2-1))^(1/2)*(-c
^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(
1/2))+5*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d^2/(2*c^2*x^2-2)*a
rcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^3, x) + 1/6*(15*c^2*
d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - 3*(-c^2*d
*x^2 + d)^(5/2)*c^2 - 5*(-c^2*d*x^2 + d)^(3/2)*c^2*d - 15*sqrt(-c^2*d*x^2 +
 d)*c^2*d^2 - 3*(-c^2*d*x^2 + d)^(7/2)/(d*x^2))*a
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**3, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^3, x)
```

3.98 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}{x^5}\,dx$

Optimal. Leaf size=389

$$-\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}-\frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))+\frac{5c^2d(a}{}$$

```
[Out] 5/8*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2-1/4*(-c^2*d*x^2+d)^(5/
2)*(a+b*arcsin(c*x))/x^4+15/8*c^4*d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)-1/12*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^3/(-c^2*x^2+1)^(1/2)+9/8*b*c^3*d^2*(-
c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)-b*c^5*d^2*x*(-c^2*d*x^2+d)^(1/2)/(-
c^2*x^2+1)^(1/2)-15/4*c^4*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^
(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+15/8*I*b*c^4*d^2*polylog(2,-
I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-15/8*I*b*
c^4*d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)
```

Rubi [A]
time = 0.31, antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4785, 4783, 4803, 4268, 2317, 2438, 8, 14, 276}

$$\frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\mathrm{ArcSin}(cx))}{8x^2}-\frac{(d-c^2dx^2)^{5/2}(a+b\mathrm{ArcSin}(cx))}{4x^4}+\frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))-\frac{15c^4d^2\sqrt{d-c^2dx^2}\tanh^{-1}\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{4\sqrt{1-c^2x^2}}+\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(-e^{i\mathrm{ArcSin}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(e^{i\mathrm{ArcSin}(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}-\frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] -1/12*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^3*Sqrt[1 - c^2*x^2]) + (9*b*c^3*d^2*
Sqrt[d - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x*Sqrt[d - c^2*d*
x^2])/Sqrt[1 - c^2*x^2] + (15*c^4*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/8 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*x^2) - ((d -
 c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(4*x^4) - (15*c^4*d^2*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt[1 - c^2*x^2])
 + (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])]
)/Sqrt[1 - c^2*x^2] - (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2,
E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{x^5}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))}{4x^4} - \frac{1}{4}(5c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a+\ldots}{x^3}$$

$$= \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\sin^{-1}(cx))}{8x^2} - \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(c\ldots}{4x^4}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3d^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{15\ldots}{8\ldots}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \ldots$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \ldots$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \ldots$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \ldots$$

Mathematica [A]
time = 4.01, size = 640, normalized size = 1.65

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*d^2*Sqrt[d - c^2*d*x^2]*(-2 + 9*c^2*x^2 + 8*c^4*x^4))/(8*x^4) + (15*a*c^
4*d^(5/2)*Log[x])/8 - (15*a*c^4*d^(5/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]
])/8 + (b*c^4*d^2*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcS
```

```
in[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x
])]))/Sqrt[1 - c^2*x^2] - (b*c^4*d^3*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/
2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c
*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*A
rcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin
[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(4*Sqrt[d - c^2*d*x^2]) + (b*c^4*d^2*Sq
rt[d - c^2*d*x^2]*(8*Cot[ArcSin[c*x]/2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^
2 - c*x*Csc[ArcSin[c*x]/2]^4 - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcS
in[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x
])] - (24*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin
[c*x])] - 6*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x
]/2]^4 - (16*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*
Sqrt[1 - c^2*x^2])
```

Maple [A]
time = 0.30, size = 727, normalized size = 1.87

method	result
default	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{7}{2}}}{4 d\,x^{4}}+\frac{3 a\,c^{2} \left(-c^{2} d\,x^{2}+d\right)^{\frac{7}{2}}}{8 d\,x^{2}}+\frac{3 a\,c^{4} \left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{8}+\frac{5 a\,c^{4} d \left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{8}-\frac{15 a\,c^{4} d^{\frac{5}{2}} \ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2}}}{x}\right.}{8}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(7/2)+3/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(7/2)+3/8*
a*c^4*(-c^2*d*x^2+d)^(5/2)+5/8*a*c^4*d*(-c^2*d*x^2+d)^(3/2)-15/8*a*c^4*d^(5
/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+15/8*a*c^4*(-c^2*d*x^2+d)^(1
/2)*d^2+b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)*x^2+b*(-d*
(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+1/8*b*(-d*(c^2*
x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)-9/8*b*d^2*(-d*(c^2*x^2-1))^(1
/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-11/8*b*d^2*(-d*(c^2*x^2-1))^(1/2)/
x^2/(c^2*x^2-1)*arcsin(c*x)*c^2+1/12*b*d^2*(-d*(c^2*x^2-1))^(1/2)/x^3/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/4*b*d^2*(-d*(c^2*x^2-1))^(1/2)/x^4/(c^2*x^2-1
)*arcsin(c*x)+15*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d^2*c^4/(8*c^2
*x^2-8)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*arcsin(c*x)-15*b*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)*d^2*c^4/(8*c^2*x^2-8)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))
*arcsin(c*x)-15*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d^2*c^4/(8*c^
2*x^2-8)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+15*I*b*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)*d^2*c^4/(8*c^2*x^2-8)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^5, x) - 1/8*(15*c^4*
d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - 3*(-c^2*d
*x^2 + d)^(5/2)*c^4 - 5*(-c^2*d*x^2 + d)^(3/2)*c^4*d - 15*sqrt(-c^2*d*x^2 +
 d)*c^4*d^2 - 3*(-c^2*d*x^2 + d)^(7/2)*c^2/(d*x^2) + 2*(-c^2*d*x^2 + d)^(7/
2)/(d*x^4))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^5, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}{x^{5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**5, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^5,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^5, x)
```

3.99 $\int \sqrt{1-x^2} \operatorname{ArcSin}(x)\,dx$

Optimal. Leaf size=34

$$-\frac{x^2}{4}+\frac{1}{2}x\sqrt{1-x^2}\operatorname{ArcSin}(x)+\frac{\operatorname{ArcSin}(x)^2}{4}$$

```
[Out] -1/4*x^2+1/4*arcsin(x)^2+1/2*x*arcsin(x)*(-x^2+1)^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4741, 4737, 30}

$$\frac{1}{2}\sqrt{1-x^2}\,x\operatorname{ArcSin}(x)+\frac{\operatorname{ArcSin}(x)^2}{4}-\frac{x^2}{4}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[1 - x^2]*ArcSin[x],x]
```

```
[Out] -1/4*x^2 + (x*Sqrt[1 - x^2]*ArcSin[x])/2 + ArcSin[x]^2/4
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \sqrt{1-x^2} \sin^{-1}(x)\, dx = \frac{1}{2}x\sqrt{1-x^2} \sin^{-1}(x) - \frac{\int x\, dx}{2} + \frac{1}{2}\int \frac{\sin^{-1}(x)}{\sqrt{1-x^2}}\, dx$$
$$= -\frac{x^2}{4} + \frac{1}{2}x\sqrt{1-x^2} \sin^{-1}(x) + \frac{1}{4}\sin^{-1}(x)^2$$

Mathematica [A]
time = 0.01, size = 30, normalized size = 0.88

$$\frac{1}{4}\left(-x^2 + 2x\sqrt{1-x^2}\, \text{ArcSin}(x) + \text{ArcSin}(x)^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[1 - x^2]*ArcSin[x],x]
[Out] (-x^2 + 2*x*Sqrt[1 - x^2]*ArcSin[x] + ArcSin[x]^2)/4
```

Maple [A]
time = 0.12, size = 31, normalized size = 0.91

method	result	size
default	$\frac{\arcsin(x)\left(\sqrt{-x^2+1}\, x+\arcsin(x)\right)}{2} - \frac{\arcsin(x)^2}{4} - \frac{x^2}{4}$	31

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x)*(-x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*arcsin(x)*((-x^2+1)^(1/2)*x+arcsin(x))-1/4*arcsin(x)^2-1/4*x^2
```

Maxima [A]
time = 0.48, size = 30, normalized size = 0.88

$$-\frac{1}{4}x^2 + \frac{1}{2}\left(\sqrt{-x^2+1}\, x + \arcsin(x)\right)\arcsin(x) - \frac{1}{4}\arcsin(x)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="maxima")
[Out] -1/4*x^2 + 1/2*(sqrt(-x^2 + 1)*x + arcsin(x))*arcsin(x) - 1/4*arcsin(x)^2
```

Fricas [A]
time = 1.76, size = 26, normalized size = 0.76

$$\frac{1}{2}\sqrt{-x^2+1}\, x\arcsin(x) - \frac{1}{4}x^2 + \frac{1}{4}\arcsin(x)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(-x^2 + 1)*x*arcsin(x) - 1/4*x^2 + 1/4*arcsin(x)^2
```

Sympy [A]
time = 1.06, size = 39, normalized size = 1.15

$$\left(\begin{cases} \frac{x\sqrt{1-x^2}}{2} + \frac{\operatorname{asin}(x)}{2} & \text{for}\ x > -1 \wedge x < 1 \end{cases}\right)\operatorname{asin}(x) - \begin{cases} \text{NaN} & \text{for}\ x < -1 \\ \frac{x^2}{4} + \frac{\operatorname{asin}^2(x)}{4} & \text{for}\ x < 1 \\ \text{NaN} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x)*(-x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x*sqrt(1 - x**2)/2 + asin(x)/2, (x > -1) & (x < 1)))*asin(x) - P
iecewise((nan, x < -1), (x**2/4 + asin(x)**2/4, x < 1), (nan, True))
```

Giac [A]
time = 0.39, size = 27, normalized size = 0.79

$$\frac{1}{2}\sqrt{-x^2+1}\,x\arcsin(x) - \frac{1}{4}x^2 + \frac{1}{4}\arcsin(x)^2 + \frac{1}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(-x^2 + 1)*x*arcsin(x) - 1/4*x^2 + 1/4*arcsin(x)^2 + 1/8
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \operatorname{asin}(x)\,\sqrt{1-x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x)*(1 - x^2)^(1/2),x)
```

```
[Out] int(asin(x)*(1 - x^2)^(1/2), x)
```

3.100 $\int \sqrt{\pi - c^2\pi x^2} \, (a + b\text{ArcSin}(cx)) \, dx$

Optimal. Leaf size=68

$$-\frac{1}{4}bc\sqrt{\pi}\,x^2 + \frac{1}{2}x\sqrt{\pi - c^2\pi x^2}\,(a + b\text{ArcSin}(cx)) + \frac{\sqrt{\pi}\,(a + b\text{ArcSin}(cx))^2}{4bc}$$

```
[Out] -1/4*b*c*x^2*Pi^(1/2)+1/4*(a+b*arcsin(c*x))^2*Pi^(1/2)/b/c+1/2*x*(a+b*arcsi
n(c*x))*(-Pi*c^2*x^2+Pi)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {4741, 4737, 30}

$$\frac{1}{2}x\sqrt{\pi - \pi c^2x^2}\,(a + b\text{ArcSin}(cx)) + \frac{\sqrt{\pi}\,(a + b\text{ArcSin}(cx))^2}{4bc} - \frac{1}{4}\sqrt{\pi}\,bcx^2$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(b*c*Sqrt[Pi]*x^2) + (x*Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]))/2 +
 (Sqrt[Pi]*(a + b*ArcSin[c*x])^2)/(4*b*c)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \sqrt{\pi - c^2\pi x^2}\,(a + b\sin^{-1}(cx))\,dx = \frac{1}{2}x\sqrt{\pi - c^2\pi x^2}\,(a + b\sin^{-1}(cx)) + \frac{\sqrt{\pi - c^2\pi x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} -$$

$$= -\frac{bcx^2\sqrt{\pi - c^2\pi x^2}}{4\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{\pi - c^2\pi x^2}\,(a + b\sin^{-1}(cx)) + \frac{\sqrt{\pi - c^2\pi}}{4b}$$

Mathematica [A]
time = 0.02, size = 87, normalized size = 1.28

$$\frac{\sqrt{\pi}\left(a^2 - b^2c^2x^2 + 2abcx\sqrt{1-c^2x^2} + 2b\left(a + bcx\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx) + b^2\text{ArcSin}(cx)^2\right)}{4bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[Pi]*(a^2 - b^2*c^2*x^2 + 2*a*b*c*x*Sqrt[1 - c^2*x^2] + 2*b*(a + b*c*x
*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(4*b*c)
```

Maple [A]
time = 0.08, size = 97, normalized size = 1.43

method	result
default	$\frac{ax\sqrt{-\pi c^2x^2+\pi}}{2} + \frac{a\pi\arctan\left(\frac{\sqrt{\pi c^2}\,x}{\sqrt{-\pi c^2x^2+\pi}}\right)}{2\sqrt{\pi c^2}} + \frac{b\sqrt{\pi}\left(2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc - c^2x^2 + \arcsin(cx)^2\right)}{4c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-Pi*c^2*x^2+Pi)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a*x*(-Pi*c^2*x^2+Pi)^(1/2)+1/2*a*Pi/(Pi*c^2)^(1/2)*arctan((Pi*c^2)^(1/2
)*x/(-Pi*c^2*x^2+Pi)^(1/2))+1/4*b*Pi^(1/2)*(2*(-c^2*x^2+1)^(1/2)*arcsin(c*x
)*x*c-c^2*x^2+arcsin(c*x)^2)/c
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(pi)*b*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)), x) + 1/2*(sqrt(pi - pi*c^2*x^2)*x + sqrt(pi)*arcsin(c*x)
/c)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(pi - pi*c^2*x^2)*(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\sqrt{\pi}\left(\int a\sqrt{-c^2x^2+1}\,dx+\int b\sqrt{-c^2x^2+1}\,\operatorname{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-pi*c**2*x**2+pi)**(1/2),x)
[Out] sqrt(pi)*(Integral(a*sqrt(-c**2*x**2 + 1), x) + Integral(b*sqrt(-c**2*x**2
+ 1)*asin(c*x), x))
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{\Pi-\Pi\,c^2\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(Pi - Pi*c^2*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))*(Pi - Pi*c^2*x^2)^(1/2), x)
```

3.101 $\int \frac{x^4 \text{ArcSin}(ax)}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=88

$$\frac{3x^2}{16a^3} + \frac{x^4}{16a} - \frac{3x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{4a^2} + \frac{3\text{ArcSin}(ax)^2}{16a^5}$$

```
[Out] 3/16*x^2/a^3+1/16*x^4/a+3/16*arcsin(a*x)^2/a^5-3/8*x*arcsin(a*x)*(-a^2*x^2+
1)^(1/2)/a^4-1/4*x^3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A]
time = 0.10, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4795, 4737, 30}

$$\frac{3\text{ArcSin}(ax)^2}{16a^5} + \frac{3x^2}{16a^3} - \frac{x^3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{4a^2} - \frac{3x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{8a^4} + \frac{x^4}{16a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (3*x^2)/(16*a^3) + x^4/(16*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(8*a^4)
 - (x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) + (3*ArcSin[a*x]^2)/(16*a^5)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
```

```
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^4 \sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{4a^2} + \frac{3\int \frac{x^2\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx}{4a^2} + \frac{\int x^3\,dx}{4a}$$
$$= \frac{x^4}{16a} - \frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{4a^2} + \frac{3\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx}{8a^4} + \frac{3}{}$$
$$= \frac{3x^2}{16a^3} + \frac{x^4}{16a} - \frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{4a^2} + \frac{3\sin^{-1}(ax)^2}{16a^5}$$

Mathematica [A]
time = 0.02, size = 64, normalized size = 0.73

$$\frac{a^2x^2(3+a^2x^2) - 2ax\sqrt{1-a^2x^2}\,(3+2a^2x^2)\,\text{ArcSin}(ax) + 3\text{ArcSin}(ax)^2}{16a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a^2*x^2*(3 + a^2*x^2) - 2*a*x*Sqrt[1 - a^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x
] + 3*ArcSin[a*x]^2)/(16*a^5)
```

Maple [A]
time = 0.14, size = 76, normalized size = 0.86

method	result	size
default	$\frac{-16\arcsin(ax)\sqrt{-a^2x^2+1}\,a^3x^3+4a^4x^4-24ax\arcsin(ax)\sqrt{-a^2x^2+1}+12a^2x^2+12\arcsin(ax)^2+9}{64a^5}$	76

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/64*(-16*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^3*x^3+4*a^4*x^4-24*a*x*arcsin(a*
x)*(-a^2*x^2+1)^(1/2)+12*a^2*x^2+12*arcsin(a*x)^2+9)/a^5
```

Maxima [A]
time = 0.49, size = 85, normalized size = 0.97

$$\frac{1}{16}\left(\frac{x^4}{a^2} + \frac{3\,x^2}{a^4} - \frac{3\,\arcsin\left(ax\right)^2}{a^6}\right)a - \frac{1}{8}\left(\frac{2\,\sqrt{-a^2x^2+1}\,x^3}{a^2} + \frac{3\,\sqrt{-a^2x^2+1}\,x}{a^4} - \frac{3\,\arcsin\left(ax\right)}{a^5}\right)\arcsin\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/16*(x^4/a^2 + 3*x^2/a^4 - 3*arcsin(a*x)^2/a^6)*a - 1/8*(2*sqrt(-a^2*x^2 +
 1)*x^3/a^2 + 3*sqrt(-a^2*x^2 + 1)*x/a^4 - 3*arcsin(a*x)/a^5)*arcsin(a*x)
```

Fricas [A]
time = 1.65, size = 60, normalized size = 0.68

$$\frac{a^4x^4 + 3\,a^2x^2 - 2\,(2\,a^3x^3 + 3\,ax)\sqrt{-a^2x^2+1}\,\arcsin{(ax)} + 3\,\arcsin{(ax)}^2}{16\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/16*(a^4*x^4 + 3*a^2*x^2 - 2*(2*a^3*x^3 + 3*a*x)*sqrt(-a^2*x^2 + 1)*arcsin
(a*x) + 3*arcsin(a*x)^2)/a^5
```

Sympy [A]
time = 0.48, size = 82, normalized size = 0.93

$$\begin{cases} \frac{x^4}{16a} - \frac{x^3\sqrt{-a^2x^2+1}\,\operatorname{asin}{(ax)}}{4a^2} + \frac{3x^2}{16a^3} - \frac{3x\sqrt{-a^2x^2+1}\,\operatorname{asin}{(ax)}}{8a^4} + \frac{3\operatorname{asin}^2{(ax)}}{16a^5} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**4/(16*a) - x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)/(4*a**2) + 3*x
**2/(16*a**3) - 3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(8*a**4) + 3*asin(a*x)**
2/(16*a**5), Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.43, size = 91, normalized size = 1.03

$$\frac{(-a^2x^2+1)^{\frac{3}{2}}x\arcsin{(ax)}}{4\,a^4} - \frac{5\,\sqrt{-a^2x^2+1}\,x\arcsin{(ax)}}{8\,a^4} + \frac{(a^2x^2-1)^2}{16\,a^5} + \frac{3\,\arcsin{(ax)}^2}{16\,a^5} + \frac{5\,(a^2x^2-1)}{16\,a^5} + \frac{17}{128\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arcsi
n(a*x)/a^4 + 1/16*(a^2*x^2 - 1)^2/a^5 + 3/16*arcsin(a*x)^2/a^5 + 5/16*(a^2*
x^2 - 1)/a^5 + 17/128/a^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^4*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.102 $\int \frac{x^3 \mathbf{ArcSin}(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=72

$$\frac{2x}{3a^3}+\frac{x^3}{9a}-\frac{2\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{3a^2}$$

```
[Out] 2/3*x/a^3+1/9*x^3/a-2/3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^4-1/3*x^2*arcsin(a
*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A]
time = 0.08, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4795, 4767, 8, 30}

$$\frac{2x}{3a^3}-\frac{x^2\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{3a^2}-\frac{2\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{3a^4}+\frac{x^3}{9a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*x)/(3*a^3) + x^3/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^4) - (x^
2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
```

```
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x^3 \sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx &= -\frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{3a^2}+\frac{2\int \frac{x\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx}{3a^2}+\frac{\int x^2\,dx}{3a}\\ &= \frac{x^3}{9a}-\frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{3a^2}+\frac{2\int 1\,dx}{3a^3}\\ &= \frac{2x}{3a^3}+\frac{x^3}{9a}-\frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{3a^2}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 0.68

$$\frac{ax(6+a^2x^2)-3\sqrt{1-a^2x^2}\,(2+a^2x^2)\,\mathrm{ArcSin}(ax)}{9a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a*x*(6 + a^2*x^2) - 3*Sqrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin[a*x])/(9*a^4)
```

Maple [A]
time = 0.07, size = 95, normalized size = 1.32

method	result	size
default	$-\frac{\left(3a^4x^4\arcsin(ax)+3a^2x^2\arcsin(ax)+a^3x^3\sqrt{-a^2x^2+1}-6\arcsin(ax)+6ax\sqrt{-a^2x^2+1}\right)\sqrt{-a^2x^2+1}}{9a^4(a^2x^2-1)}$	95

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/9/a^4*(3*a^4*x^4*arcsin(a*x)+3*a^2*x^2*arcsin(a*x)+a^3*x^3*(-a^2*x^2+1)^
(1/2)-6*arcsin(a*x)+6*a*x*(-a^2*x^2+1)^(1/2))*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1
)
```

Maxima [A]
time = 0.48, size = 61, normalized size = 0.85

$$\frac{1}{9}\,a\left(\frac{x^3}{a^2}+\frac{6\,x}{a^4}\right)-\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}\,x^2}{a^2}+\frac{2\,\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/9*a*(x^3/a^2 + 6*x/a^4) - 1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x
^2 + 1)/a^4)*arcsin(a*x)
```

Fricas [A]
time = 2.12, size = 44, normalized size = 0.61

$$\frac{a^3x^3-3\left(a^2x^2+2\right)\sqrt{-a^2x^2+1}\,\arcsin\left(ax\right)+6\,ax}{9\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/9*(a^3*x^3 - 3*(a^2*x^2 + 2)*sqrt(-a^2*x^2 + 1)*arcsin(a*x) + 6*a*x)/a^4
```

Sympy [A]
time = 0.35, size = 65, normalized size = 0.90

$$\begin{cases}\frac{x^3}{9a}-\frac{x^2\sqrt{-a^2x^2+1}\,\operatorname{asin}\left(ax\right)}{3a^2}+\frac{2x}{3a^3}-\frac{2\sqrt{-a^2x^2+1}\,\operatorname{asin}\left(ax\right)}{3a^4} & \text{for}\ a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**3/(9*a) - x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(3*a**2) + 2*x/
(3*a**3) - 2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(3*a**4), Ne(a, 0)), (0, True))
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^3*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.103 $\int \frac{x^2 \mathbf{ArcSin}(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=50

$$\frac{x^2}{4a}-\frac{x\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{2a^2}+\frac{\mathrm{ArcSin}(ax)^2}{4a^3}$$

```
[Out] 1/4*x^2/a+1/4*arcsin(a*x)^2/a^3-1/2*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A]
time = 0.06, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4795, 4737, 30}

$$\frac{\mathrm{ArcSin}(ax)^2}{4a^3}-\frac{x\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{2a^2}+\frac{x^2}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x^2/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*a^2) + ArcSin[a*x]^2/(4*a^
3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^2 \sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx = -\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{2a^2} + \frac{\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx}{2a^2} + \frac{\int x\,dx}{2a}$$
$$= \frac{x^2}{4a} - \frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{2a^2} + \frac{\sin^{-1}(ax)^2}{4a^3}$$

Mathematica [A]
time = 0.01, size = 43, normalized size = 0.86

$$\frac{a^2x^2 - 2ax\sqrt{1-a^2x^2}\,\text{ArcSin}(ax) + \text{ArcSin}(ax)^2}{4a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
[Out] (a^2*x^2 - 2*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + ArcSin[a*x]^2)/(4*a^3)
```

Maple [A]
time = 0.08, size = 40, normalized size = 0.80

method	result	size
default	$\frac{-2ax\arcsin(ax)\sqrt{-a^2x^2+1}+a^2x^2+\arcsin(ax)^2}{4a^3}$	40

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/4*(-2*a*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)+a^2*x^2+arcsin(a*x)^2)/a^3
```

Maxima [A]
time = 0.48, size = 56, normalized size = 1.12

$$\frac{1}{4}\,a\left(\frac{x^2}{a^2} - \frac{\arcsin(ax)^2}{a^4}\right) - \frac{1}{2}\left(\frac{\sqrt{-a^2x^2+1}\,x}{a^2} - \frac{\arcsin(ax)}{a^3}\right)\arcsin(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/4*a*(x^2/a^2 - arcsin(a*x)^2/a^4) - 1/2*(sqrt(-a^2*x^2 + 1)*x/a^2 - arcsi
n(a*x)/a^3)*arcsin(a*x)
```

Fricas [A]
time = 1.68, size = 39, normalized size = 0.78

$$\frac{a^2x^2 - 2\sqrt{-a^2x^2+1}\,ax\arcsin(ax) + \arcsin(ax)^2}{4\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*(a^2*x^2 - 2*sqrt(-a^2*x^2 + 1)*a*x*arcsin(a*x) + arcsin(a*x)^2)/a^3
```

Sympy [A]
time = 0.28, size = 42, normalized size = 0.84

$$\begin{cases} \frac{x^2}{4a} - \frac{x\sqrt{-a^2x^2+1}\,\operatorname{asin}(ax)}{2a^2} + \frac{\operatorname{asin}^2(ax)}{4a^3} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**2/(4*a) - x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(2*a**2) + asin(a*
x)**2/(4*a**3), Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.41, size = 53, normalized size = 1.06

$$-\frac{\sqrt{-a^2x^2+1}\,x\arcsin(ax)}{2\,a^2} + \frac{\arcsin(ax)^2}{4\,a^3} + \frac{a^2x^2-1}{4\,a^3} + \frac{1}{8\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)/a^2 + 1/4*arcsin(a*x)^2/a^3 + 1/4*(a^
2*x^2 - 1)/a^3 + 1/8/a^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^2\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^2*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.104 $\int \frac{x\mathbf{ArcSin}(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=29

$$\frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{a^2}$$

```
[Out] x/a-arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A]
time = 0.03, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4767, 8}

$$\frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x/a - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2}+\frac{\int 1\,dx}{a}\\ &= \frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 29, normalized size = 1.00

$$\frac{x}{a}-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x/a - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 61 vs. $2(27) = 54$.
time = 0.08, size = 62, normalized size = 2.14

method	result	size
default	$-\frac{\sqrt{-a^2x^2+1}\,\left(a^2x^2\arcsin(ax)-\arcsin(ax)+ax\sqrt{-a^2x^2+1}\right)}{a^2(a^2x^2-1)}$	62

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(a^2*x^2*arcsin(a*x)-arcsin(a*x)+a*x*
(-a^2*x^2+1)^(1/2))
```

Maxima [A]
time = 0.48, size = 27, normalized size = 0.93

$$\frac{x}{a}-\frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] x/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/a^2
```

Fricas [A]
time = 2.24, size = 26, normalized size = 0.90

$$\frac{ax-\sqrt{-a^2x^2+1}\,\arcsin(ax)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (a*x - sqrt(-a^2*x^2 + 1)*arcsin(a*x))/a^2
```

Sympy [A]
time = 0.21, size = 24, normalized size = 0.83

$$\begin{cases} \frac{x}{a}-\frac{\sqrt{-a^2x^2+1}\,\operatorname{asin}(ax)}{a^2} & \text{for } a\neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x/a - sqrt(-a**2*x**2 + 1)*asin(a*x)/a**2, Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.40, size = 27, normalized size = 0.93

$$\frac{x}{a} - \frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] x/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/a^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.105 $\int \frac{\text{ArcSin}(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=13

$$\frac{\text{ArcSin}(ax)^2}{2a}$$

```
[Out] 1/2*arcsin(a*x)^2/a
```

Rubi [A]
time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = {4737}

$$\frac{\text{ArcSin}(ax)^2}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^2/(2*a)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\sin^{-1}(ax)^2}{2a}$$

Mathematica [A]
time = 0.00, size = 13, normalized size = 1.00

$$\frac{\text{ArcSin}(ax)^2}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^2/(2*a)
```

Maple [A]
time = 0.07, size = 12, normalized size = 0.92

method	result	size
derivativedivides	$\frac{\arcsin(ax)^2}{2a}$	12
default	$\frac{\arcsin(ax)^2}{2a}$	12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*arcsin(a*x)^2/a
```

Maxima [A]
time = 0.47, size = 11, normalized size = 0.85

$$\frac{\arcsin(ax)^2}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/2*arcsin(a*x)^2/a
```

Fricas [A]
time = 1.68, size = 11, normalized size = 0.85

$$\frac{\arcsin(ax)^2}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/2*arcsin(a*x)^2/a
```

Sympy [A]
time = 0.20, size = 10, normalized size = 0.77

$$\begin{cases} \frac{\operatorname{asin}^{2}(ax)}{2a} & \text{for}\ a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((asin(a*x)**2/(2*a), Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.40, size = 11, normalized size = 0.85

$$\frac{\arcsin\left(ax\right)^{2}}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*arcsin(a*x)^2/a
```

Mupad [B]
time = 0.14, size = 11, normalized size = 0.85

$$\frac{\mathrm{asin}(a\,x)^2}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] asin(a*x)^2/(2*a)
```

3.106 $\int \frac{\mathbf{ArcSin}(ax)}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=52

$$-2\text{ArcSin}(ax)\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)+i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right)-i\text{PolyLog}\left(2,e^{i\text{ArcSin}(ax)}\right)$$

```
[Out] -2*arcsin(a*x)*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+I*polylog(2,-I*a*x-(-a^2*x
^2+1)^(1/2))-I*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))
```

Rubi [A]
time = 0.06, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4803, 4268, 2317, 2438}

$$i\text{Li}_2\left(-e^{i\text{ArcSin}(ax)}\right)-i\text{Li}_2\left(e^{i\text{ArcSin}(ax)}\right)-2\text{ArcSin}(ax)\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] + I*PolyLog[2, -E^(I*ArcSin[a*x])
] - I*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)}{x\sqrt{1-a^2x^2}}\,dx &= \text{Subst}\left(\int x\csc(x)\,dx, x, \sin^{-1}(ax)\right)\\ &= -2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - \text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \sin^{-1}(ax)\right) + \text{Subst}\left(\right.\\ &= -2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + i\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\sin^{-1}(ax)}\right) - i\text{Subst}\left(\right.\\ &= -2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + i\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - i\text{Li}_2\left(e^{i\sin^{-1}(ax)}\right)\end{aligned}$$

Mathematica [A]
time = 0.06, size = 71, normalized size = 1.37

$$\text{ArcSin}(ax)\left(\log\left(1-e^{i\text{ArcSin}(ax)}\right)-\log\left(1+e^{i\text{ArcSin}(ax)}\right)\right)+i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right)-i\text{PolyLog}\left(2,e^{i\text{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] ArcSin[a*x]*(Log[1 - E^(I*ArcSin[a*x])] - Log[1 + E^(I*ArcSin[a*x])]) + I*P
olyLog[2, -E^(I*ArcSin[a*x])] - I*PolyLog[2, E^(I*ArcSin[a*x])]
```

Maple [A]
time = 0.08, size = 103, normalized size = 1.98

method	result
default	$\arcsin(ax)\ln\left(1-iax-\sqrt{-a^2x^2+1}\right)-\arcsin(ax)\ln\left(1+iax+\sqrt{-a^2x^2+1}\right)+i\,\text{dilog}\left(1+\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-arcsin(a*x)*ln(1+I*a*x+(-a^2*x^2
+1)^(1/2))+I*dilog(1+I*a*x+(-a^2*x^2+1)^(1/2))-I*dilog(1-I*a*x-(-a^2*x^2+1)
^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)/(a^2*x^3 - x), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\operatorname{asin}(a\,x)}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)/(x*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] int(asin(a*x)/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.107 $\int \frac{\text{ArcSin}(ax)}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=28

$$-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{x}+a\log(x)$$

```
[Out] a*ln(x)-arcsin(a*x)*(-a^2*x^2+1)^(1/2)/x
```

Rubi [A]
time = 0.04, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {4771, 29}

$$a\log(x)-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -((Sqrt[1 - a^2*x^2]*ArcSin[a*x])/x) + a*Log[x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)}{x^2\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{x}+a\int \frac{1}{x}\,dx\\ &= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{x}+a\log(x)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 28, normalized size = 1.00

$$-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{x}+a\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]/(x^2*Sqrt[1 - a^2*x^2]),x]
[Out] -((Sqrt[1 - a^2*x^2]*ArcSin[a*x])/x) + a*Log[x]
```

Maple [A]
time = 0.07, size = 32, normalized size = 1.14

method	result	size
default	$-\frac{-\ln(ax)ax+\arcsin(ax)\sqrt{-a^2x^2+1}}{x}$	32

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -(-ln(a*x)*a*x+arcsin(a*x)*(-a^2*x^2+1)^(1/2))/x
```

Maxima [A]
time = 0.48, size = 26, normalized size = 0.93

$$a\log\left(x\right)-\frac{\sqrt{-a^2x^2+1}\arcsin\left(ax\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] a*log(x) - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/x
```

Fricas [A]
time = 1.91, size = 28, normalized size = 1.00

$$\frac{ax\log\left(x\right)-\sqrt{-a^2x^2+1}\arcsin\left(ax\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] (a*x*log(x) - sqrt(-a^2*x^2 + 1)*arcsin(a*x))/x
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}(ax)}{x^2\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/x**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 67 vs. 2(26) = 52.
time = 0.40, size = 67, normalized size = 2.39

$$\frac{1}{2}\left(\frac{a^4x}{\left(\sqrt{-a^2x^2+1}\,|a|+a\right)|a|}-\frac{\sqrt{-a^2x^2+1}\,|a|+a}{x|a|}\right)\arcsin(ax)+a\log(|x|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*(a^4*x/((sqrt(-a^2*x^2 + 1)*abs(a) + a)*abs(a)) - (sqrt(-a^2*x^2 + 1)*a
bs(a) + a)/(x*abs(a)))*arcsin(a*x) + a*log(abs(x))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\operatorname{asin}(a\,x)}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)/(x^2*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] int(asin(a*x)/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.108 $\int \frac{\mathbf{ArcSin}(ax)}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=98

$$-\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{2x^2}-a^2\text{ArcSin}(ax)\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)+\frac{1}{2}ia^2\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right)-\frac{1}{2}ia^2\text{Pol}$$

```
[Out] -1/2*a/x-a^2*arcsin(a*x)*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+1/2*I*a^2*polylo
g(2,-I*a*x-(-a^2*x^2+1)^(1/2))-1/2*I*a^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2)
)-1/2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.11, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4789, 4803, 4268, 2317, 2438, 30}

$$\frac{1}{2}ia^2\text{Li}_2\left(-e^{i\text{ArcSin}(ax)}\right)-\frac{1}{2}ia^2\text{Li}_2\left(e^{i\text{ArcSin}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{2x^2}+a^2(-\text{ArcSin}(ax))\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)-\frac{a}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -1/2*a/x - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*x^2) - a^2*ArcSin[a*x]*ArcTan
h[E^(I*ArcSin[a*x])] + (I/2)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (I/2)*a^2
*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sin^{-1}(ax)}{x^3\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{2x^2}+\frac{1}{2}a\int\frac{1}{x^2}\,dx+\frac{1}{2}a^2\int\frac{\sin^{-1}(ax)}{x\sqrt{1-a^2x^2}}\,dx\\
&= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{2x^2}+\frac{1}{2}a^2\text{Subst}\left(\int x\csc(x)\,dx,x,\sin^{-1}(ax)\right)\\
&= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{2x^2}-a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)-\frac{1}{2}a^2\text{Subst}\left(\int \log\right.\\
&= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{2x^2}-a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)+\frac{1}{2}\left(ia^2\right)\text{Subst}\left(\int\right.\\
&= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{2x^2}-a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right)+\frac{1}{2}ia^2\text{Li}_2\left(-e^{i\sin^{-1}(\right.
\end{aligned}$$

Mathematica [A]
time = 0.56, size = 137, normalized size = 1.40

$$\frac{1}{8}a^2\left(-2\cot\left(\frac{1}{2}\text{ArcSin}(ax)\right)-\text{ArcSin}(ax)\csc^2\left(\frac{1}{2}\text{ArcSin}(ax)\right)+4\text{ArcSin}(ax)\log\left(1-e^{i\text{ArcSin}(ax)}\right)-4\text{ArcSin}(ax)\log\left(1+e^{i\text{ArcSin}(ax)}\right)+4i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right)-4i\text{PolyLog}\left(2,e^{i\text{ArcSin}(ax)}\right)+\text{ArcSin}(ax)\sec^2\left(\frac{1}{2}\text{ArcSin}(ax)\right)-2\tan\left(\frac{1}{2}\text{ArcSin}(ax)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*(-2*Cot[ArcSin[a*x]/2] - ArcSin[a*x]*Csc[ArcSin[a*x]/2]^2 + 4*ArcSin[a
*x]*Log[1 - E^(I*ArcSin[a*x])] - 4*ArcSin[a*x]*Log[1 + E^(I*ArcSin[a*x])] +
 (4*I)*PolyLog[2, -E^(I*ArcSin[a*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[a*x])]
 + ArcSin[a*x]*Sec[ArcSin[a*x]/2]^2 - 2*Tan[ArcSin[a*x]/2]))/8
```

Maple [A]
time = 0.39, size = 171, normalized size = 1.74

method	result
default	$-\frac{\sqrt{-a^{2}x^{2}+1}\,\left(a^{2}x^{2}\arcsin(ax)-ax\sqrt{-a^{2}x^{2}+1}-\arcsin(ax)\right)}{2(a^{2}x^{2}-1)x^{2}}-\frac{ia^{2}\left(i\arcsin(ax)\ln\left(1-iax-\sqrt{-a^{2}x^{2}+1}\right)-i\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*(a^2*x^2*arcsin(a*x)-a*x*(-a^2*x^2+
1)^(1/2)-arcsin(a*x))-1/2*I*a^2*(I*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2
))-I*arcsin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+polylog(2,I*a*x+(-a^2*x^2+1
)^(1/2))-polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)/(a^2*x^5 - x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}{\left(ax \right)}}{x^{3}\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/x**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{asin}(a\,x)}{x^3\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)/(x^3*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] int(asin(a*x)/(x^3*(1 - a^2*x^2)^(1/2)), x)
```

3.109 $\int \frac{x^5(a+b\textbf{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=224

$$\frac{8bx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}}+\frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}}-\frac{8\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{15c^6d}-\frac{4x^2\sqrt{d-c^2dx^2}}{1}$$

```
[Out] 8/15*b*x*(-c^2*x^2+1)^(1/2)/c^5/(-c^2*d*x^2+d)^(1/2)+4/45*b*x^3*(-c^2*x^2+1
)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/25*b*x^5*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^
2+d)^(1/2)-8/15*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d-4/15*x^2*(a+b*
arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4/d-1/5*x^4*(a+b*arcsin(c*x))*(-c^2*d*x
^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.19, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4795, 4767, 8, 30}

$$-\frac{x^4\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{5c^2d}-\frac{8\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{15c^6d}-\frac{4x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{15c^4d}+\frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}}+\frac{8bx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (8*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (4*b*x^3*Sqrt[1 -
c^2*x^2])/(45*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^5*Sqrt[1 - c^2*x^2])/(25*c*Sq
rt[d - c^2*d*x^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^6*d)
 - (4*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^4*d) - (x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^5(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^4\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{5c^2d} + \frac{4\int \frac{x^3(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{5c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x}{5c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{4x^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}\,(a+b\sin}{5c^2d}$$

$$= \frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{15c^6d} - \frac{4x^2\sqrt{c}}{}$$

$$= \frac{8bx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}\,(a+b}{15c^6d}$$

Mathematica [A]
time = 0.05, size = 119, normalized size = 0.53

$$\frac{bcx\sqrt{1-c^2x^2}\,(120+20c^2x^2+9c^4x^4)+15a(-8+4c^2x^2+c^4x^4+3c^6x^6)+15b(-8+4c^2x^2+c^4x^4+3c^6x^6)\,\mathrm{ArcSin}(cx)}{225c^6\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4*x^4) + 15*a*(-8 + 4*c^2*
x^2 + c^4*x^4 + 3*c^6*x^6) + 15*b*(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6)*Ar
cSin[c*x])/(225*c^6*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.36, size = 521, normalized size = 2.33

method	result

default	$a\left(-\frac{x^4\sqrt{-c^2d\,x^2+d}}{5c^2d}+\frac{-\frac{4x^2\sqrt{-c^2d\,x^2+d}}{15c^2d}-\frac{8\sqrt{-c^2d\,x^2+d}}{15d\,c^4}}{c^2}\right)+b\left(\frac{5\sqrt{-d\,(c^2x^2-1)}\,\left(2c^2x^2-2\right.}{576c^{6}}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/5*x^4/c^2/d*(-c^2*d*x^2+d)^(1/2)+4/5/c^2*(-1/3*x^2/c^2/d*(-c^2*d*x^2+
d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2)))+b*(5/576*(-d*(c^2*x^2-1))^(1/2)*(
2*c^2*x^2-2*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+3*arcsin(c*x))/c^6/d/(c^2*x^2-1)
-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c
*x)+I)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*
x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/d/(c^2*x^2-1)+5/576*(-d*(c^2*x^2-1))^(1/
2)*(2*I*(-c^2*x^2+1)^(1/2)*x*c+2*c^2*x^2-1)*(-I+3*arcsin(c*x))/c^6/d/(c^2*x
^2-1)+1/160*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*cos(6*arcs
in(c*x))-1/800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(6*arcsin(c*x))-
11/240*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*cos(4*arcsin(c*
x))+29/1800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(4*arcsin(c*x)))
```

Maxima [A]
time = 0.50, size = 180, normalized size = 0.80

$$-\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}\,x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}\,x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)b\arcsin\left(cx\right)-\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}\,x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}\,x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)a+\frac{(9\,c^4x^5+20\,c^2x^3+120\,x)b}{225\,c^5\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/15*(3*sqrt(-c^2*d*x^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4
*d) + 8*sqrt(-c^2*d*x^2 + d)/(c^6*d))*b*arcsin(c*x) - 1/15*(3*sqrt(-c^2*d*x
^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4*d) + 8*sqrt(-c^2*d*x^
2 + d)/(c^6*d))*a + 1/225*(9*c^4*x^5 + 20*c^2*x^3 + 120*x)*b/(c^5*sqrt(d))
```

Fricas [A]
time = 1.69, size = 150, normalized size = 0.67

$$-\frac{(9\,bc^5x^5+20\,bc^3x^3+120\,bcx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+15\,(3\,ac^6x^6+ac^4x^4+4\,ac^2x^2+(3\,bc^6x^6+bc^4x^4+4\,bc^2x^2-8\,b)\arcsin\left(cx\right)-8\,a)\sqrt{-c^2dx^2+d}}{225\,(c^8dx^2-c^6d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/225*((9*b*c^5*x^5 + 20*b*c^3*x^3 + 120*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(
-c^2*x^2 + 1) + 15*(3*a*c^6*x^6 + a*c^4*x^4 + 4*a*c^2*x^2 + (3*b*c^6*x^6 +
b*c^4*x^4 + 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^
8*d*x^2 - c^6*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5(a + b\,\mathrm{asin}\,(cx))}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.110 $\int \frac{x^4(a+b\textbf{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=200

$$\frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}}+\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8c^4d}-\frac{x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{4c^2d}$$

```
[Out] 3/16*b*x^2*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/16*b*x^4*(-c^2*x^2
+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+3/16*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2
)/b/c^5/(-c^2*d*x^2+d)^(1/2)-3/8*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c
^4/d-1/4*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.16, antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4795, 4737, 30}

$$-\frac{x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{4c^2d}+\frac{3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{16bc^5\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8c^4d}+\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}}+\frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (3*b*x^2*Sqrt[1 - c^2*x^2])/(16*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 -
c^2*x^2])/(16*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcS
in[c*x]))/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(4*c^2*
d) + (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^5*Sqrt[d - c^2*d*x
^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
```

```
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^3\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{4c^2d} + \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{4c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x}{4c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{8c^4d} - \frac{x^3\sqrt{d-c^2dx^2}\,(a+b\sin^{-}}{4c^2d}$$

$$= \frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{8c^4d} - \frac{x^3\sqrt{c}}{}$$

$$= \frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{8c^4d} - \frac{x^3\sqrt{c}}{}$$

Mathematica [A]
time = 0.57, size = 161, normalized size = 0.80

$$\frac{-\frac{16acx(3+2c^2x^2)\sqrt{d-c^2dx^2}}{d} - \frac{48a\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)}{\sqrt{d}} + \frac{b\sqrt{1-c^2x^2}\,(-16\cos(2\,\mathrm{ArcSin}(cx))+\cos(4\,\mathrm{ArcSin}(cx))+4\,\mathrm{ArcSin}(cx)(6\,\mathrm{ArcSin}(cx)-8\sin(2\,\mathrm{ArcSin}(cx))+\sin(4\,\mathrm{ArcSin}(cx))))}{\sqrt{d-c^2dx^2}}}{128c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] ((-16*a*c*x*(3 + 2*c^2*x^2)*Sqrt[d - c^2*d*x^2])/d - (48*a*ArcTan[(c*x*Sqrt
[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))])/Sqrt[d] + (b*Sqrt[1 - c^2*x^2]*
(-16*Cos[2*ArcSin[c*x]] + Cos[4*ArcSin[c*x]] + 4*ArcSin[c*x]*(6*ArcSin[c*x]
 - 8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/Sqrt[d - c^2*d*x^2])/(128*c
^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 376 vs. $2(174) = 348$.
time = 0.36, size = 377, normalized size = 1.88

method	result

default	$-\frac{a\,x^{3}\sqrt{-c^{2}d\,x^{2}+d}}{4c^{2}d}-\frac{3ax\sqrt{-c^{2}d\,x^{2}+d}}{8c^{4}d}+\frac{3a\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{8c^{4}\sqrt{c^{2}d}}+b\left(-\frac{3\sqrt{-d\,(c^{2}x^{2}-1)}}{16c^{5}d}\right.$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/4*a*x^3/c^2/d*(-c^2*d*x^2+d)^(1/2)-3/8*a/c^4*x/d*(-c^2*d*x^2+d)^(1/2)+3/8*a/c^4/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)^2-1/16/c^5/(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*x-1/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*cos(5*arcsin(c*x))-1/64*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*sin(5*arcsin(c*x))+15/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*cos(3*arcsin(c*x))+7/64*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcsin(c*x)))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")

[Out] -1/8*a*(2*sqrt(-c^2*d*x^2 + d)*x^3/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*x/(c^4*d) - 3*arcsin(c*x)/(c^5*sqrt(d))) + b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")

[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^2*d*x^2 - d), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^{4}(a+b\operatorname{asin}(cx))}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.111 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=148

$$\frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3c^4d}-\frac{x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3c^2d}$$

```
[Out] 2/3*b*x*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/9*b*x^3*(-c^2*x^2+1)^
(1/2)/c/(-c^2*d*x^2+d)^(1/2)-2/3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4
/d-1/3*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.11, antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4795, 4767, 8, 30}

$$-\frac{x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3c^2d}-\frac{2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3c^4d}+\frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^3*Sqrt[1 - c^2
*x^2])/(9*c*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(3*c^4*d) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3c^2d} + \frac{2\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{3c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x^2}{3c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3c^4d} - \frac{x^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(}{3c^2d}$$

$$= \frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3c^4d} - \frac{x^2\sqrt{d-}}{}$$

Mathematica [A]
time = 0.03, size = 92, normalized size = 0.62

$$\frac{bcx\sqrt{1-c^2x^2}\,(6+c^2x^2)+3a(-2+c^2x^2+c^4x^4)+3b(-2+c^2x^2+c^4x^4)\,\mathrm{ArcSin}(cx)}{9c^4\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
[Out] (b*c*x*Sqrt[1 - c^2*x^2]*(6 + c^2*x^2) + 3*a*(-2 + c^2*x^2 + c^4*x^4) + 3*b
*(-2 + c^2*x^2 + c^4*x^4)*ArcSin[c*x])/(9*c^4*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.26, size = 407, normalized size = 2.75

method	result
default	$a\left(-\frac{x^2\sqrt{-c^2d\,x^2+d}}{3c^2d}-\frac{2\sqrt{-c^2d\,x^2+d}}{3d\,c^4}\right)+b\left(\frac{\sqrt{-d\,(c^2x^2-1)}\,\left(2c^2x^2-2i\sqrt{-c^2x^2+1}\,xc-1\right)(i+3}{144c^4d(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+b*(1
/144*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+3*a
rcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x
^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^4/d/(c^2*x^2-1)
+1/144*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x*c+2*c^2*x^2-1)*(-I+
3*arcsin(c*x))/c^4/d/(c^2*x^2-1)-1/24*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2
-1)*arcsin(c*x)*cos(4*arcsin(c*x))+1/72*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x
^2-1)*sin(4*arcsin(c*x)))
```

Maxima [A]
time = 0.49, size = 121, normalized size = 0.82

$$-\frac{1}{3}\,b\left(\frac{\sqrt{-c^2dx^2+d}\,x^2}{c^2d}+\frac{2\,\sqrt{-c^2dx^2+d}}{c^4d}\right)\arcsin\left(cx\right)-\frac{1}{3}\,a\left(\frac{\sqrt{-c^2dx^2+d}\,x^2}{c^2d}+\frac{2\,\sqrt{-c^2dx^2+d}}{c^4d}\right)+\frac{(c^2x^3+6\,x)b}{9\,c^3\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*b*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^4*d))*
arcsin(c*x) - 1/3*a*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 +
 d)/(c^4*d)) + 1/9*(c^2*x^3 + 6*x)*b/(c^3*sqrt(d))
```

Fricas [A]
time = 1.70, size = 120, normalized size = 0.81

$$-\frac{(bc^3x^3+6\,bcx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,+3\,(ac^4x^4+ac^2x^2+(bc^4x^4+bc^2x^2-2\,b)\arcsin\left(cx\right)-2\,a)\sqrt{-c^2dx^2+d}}{9\,(c^6dx^2-c^4d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/9*((b*c^3*x^3 + 6*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3*(a*
c^4*x^4 + a*c^2*x^2 + (b*c^4*x^4 + b*c^2*x^2 - 2*b)*arcsin(c*x) - 2*a)*sqrt
(-c^2*d*x^2 + d))/(c^6*d*x^2 - c^4*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^3(a+b\operatorname{asin}\left(cx\right))}{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.112 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=124

$$\frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2c^2d}+\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}$$

```
[Out] 1/4*b*x^2*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/4*(a+b*arcsin(c*x))^2
*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)-1/2*x*(a+b*arcsin(c*x))*(-c^
2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.09, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4795, 4737, 30}

$$-\frac{x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2c^2d}+\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*x^2*Sqrt[1 - c^2*x^2])/(4*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
)/(4*b*c^3*Sqrt[d - c^2*d*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2c^2d} + \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{2c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x\,dx}{2c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2c^2d} + \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c^2\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2c^2d} + \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{4bc^3\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 0.74, size = 134, normalized size = 1.08

$$-\frac{\frac{4acx\sqrt{d-c^2dx^2}}{d}+\frac{4a\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)}{\sqrt{d}}+\frac{b\sqrt{1-c^2x^2}\,\left(-2\text{ArcSin}(cx)^2+\cos(2\text{ArcSin}(cx))+2\text{ArcSin}(cx)\sin(2\text{ArcSin}(cx))\right)}{\sqrt{d-c^2dx^2}}}{8c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] -1/8*((4*a*c*x*Sqrt[d - c^2*d*x^2])/d + (4*a*ArcTan[(c*x*Sqrt[d - c^2*d*x^2
])/(Sqrt[d]*(-1 + c^2*x^2))])/Sqrt[d] + (b*Sqrt[1 - c^2*x^2]*(-2*ArcSin[c*x
]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]]))/Sqrt[d - c^2*
d*x^2])/c^3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 267 vs. 2(108) = 216.
time = 0.16, size = 268, normalized size = 2.16

method	result
default	$-\frac{ax\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{4c^3d(c^2x^2-1)}-\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2*a/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2-1/16/c^3/(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)*x+1/1
6*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*cos(3*arcsin(c*x))+1/8*(-d*(c^2*
x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcsin(c*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/2*a*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) + b*int
egrate(x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-
c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^2*d*x^2 - d),
 x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}(a+b\operatorname{asin}(cx))}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.113 $\int \frac{x(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=67

$$\frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{c^2d}$$

```
[Out] b*x*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.05, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}=0.080$, Rules used = {4767, 8}

$$\frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/(c^2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx &= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{c^2d}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int 1\,dx}{c\sqrt{d-c^2dx^2}}\\ &= \frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{c^2d}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 64, normalized size = 0.96

$$\frac{bcx\sqrt{1-c^2x^2}+a(-1+c^2x^2)+b(-1+c^2x^2)\,\mathrm{ArcSin}(cx)}{c^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2] + a*(-1 + c^2*x^2) + b*(-1 + c^2*x^2)*ArcSin[c*x])
/(c^2*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.11, size = 159, normalized size = 2.37

method	result
default	$-\frac{a\sqrt{-c^2d\,x^2+d}}{c^2d}+b\left(-\frac{\sqrt{-d\,(c^2x^2-1)}\,\left(c^2x^2-i\sqrt{-c^2x^2+1}\,xc-1\right)(\arcsin(cx)+i)}{2c^2d(c^2x^2-1)}-\frac{\sqrt{-d\,(c^2x^2-1}}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a/c^2/d*(-c^2*d*x^2+d)^(1/2)+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c
^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^2/d/(c^2*x^
2-1))
```

Maxima [A]
time = 0.48, size = 58, normalized size = 0.87

$$\frac{bx}{c\sqrt{d}}-\frac{\sqrt{-c^2dx^2+d}\,b\arcsin(cx)}{c^2d}-\frac{\sqrt{-c^2dx^2+d}\,a}{c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*x/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*
x^2 + d)*a/(c^2*d)
```

Fricas [A]
time = 2.40, size = 92, normalized size = 1.37

$$-\frac{\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,bcx+(ac^2x^2+(bc^2x^2-b)\arcsin(cx)-a)\sqrt{-c^2dx^2+d}}{c^4dx^2-c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x + (a*c^2*x^2 + (b*c^2*x^2 -
 b)*arcsin(c*x) - a)*sqrt(-c^2*d*x^2 + d))/(c^4*d*x^2 - c^2*d)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.114 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=49

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {4737}

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d - c^2*d*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\ &= \frac{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}{2bc\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 50, normalized size = 1.02

$$\frac{\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)(2a+b\text{ArcSin}(cx))}{2c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(2*a + b*ArcSin[c*x]))/(2*c*Sqrt[d - c^2*d*x
^2])
```

Maple [A]
time = 0.07, size = 86, normalized size = 1.76

method	result	size
default	$\frac{a \arctan\left(\frac{\sqrt{c^{2} d}\, x}{\sqrt{-c^{2} d\, x^{2}+d}}\right)}{\sqrt{c^{2} d}}-\frac{b \sqrt{-d\left(c^{2} x^{2}-1\right)}\, \sqrt{-c^{2} x^{2}+1}\, \arcsin\left(c x\right)^{2}}{2 c d\left(c^{2} x^{2}-1\right)}$	86

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*b*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2
```

Maxima [A]
time = 0.48, size = 28, normalized size = 0.57

$$\frac{b \arcsin\left(cx\right)^{2}}{2\, c\sqrt{d}}+\frac{a \arcsin\left(cx\right)}{c\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*b*arcsin(c*x)^2/(c*sqrt(d)) + a*arcsin(c*x)/(c*sqrt(d))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{\sqrt{-d\left(cx - 1\right)\left(cx + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(1/2), x)
```

3.115 $\int \frac{a+b\text{ArcSin}(cx)}{x\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=145

$$-\frac{2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}}{}$$

```
[Out] -2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(
-c^2*d*x^2+d)^(1/2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(
1/2)/(-c^2*d*x^2+d)^(1/2)-I*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2
+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4803, 4268, 2317, 2438}

$$-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[
d - c^2*d*x^2] + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sq
rt[d - c^2*d*x^2]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
```

```
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int\frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\ &= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\\ &= -\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\log(1\right.}{\sqrt{d-c^2d}}\\ &= -\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{\left(ib\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{\log(1}{x}\right.}{\sqrt{d-c^2dx^2}}\\ &= -\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{ib\sqrt{1-c^2x^2}\,\mathrm{Li}_2\left(-e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A]
time = 0.20, size = 146, normalized size = 1.01

$$\frac{a\log(x)}{\sqrt{d}} - \frac{a\log\left(d+\sqrt{d}\,\sqrt{-d\left(-1+c^2x^2\right)}\right)}{\sqrt{d}} + \frac{b\sqrt{1-c^2x^2}\,\left(\mathrm{ArcSin}(cx)\left(\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)-\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)\right)+i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)-i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{d\left(1-c^2x^2\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (a*Log[x])/Sqrt[d] - (a*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/Sqrt[d]
 + (b*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 +
E^(I*ArcSin[c*x])]) + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*
ArcSin[c*x])]))/Sqrt[d*(1 - c^2*x^2)]
```

Maple [A]
time = 0.12, size = 180, normalized size = 1.24

method	result
default	$-\frac{a\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^{2}d\,x^{2}+d}}{x}\right)}{\sqrt{d}}-\frac{ib\sqrt{-c^{2}x^{2}+1}\,\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\left(i\arcsin(cx)\ln\left(1+icx+\sqrt{-c^{2}x^{2}+\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)

[Out] -a/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))/d/(c^2*x^2-1)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")

[Out] b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)*x), x)/sqrt(d) - a*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/sqrt(d)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^3 - d*x), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\operatorname{asin}(cx)}{x\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(1/2),x)

```
[Out] Integral((a + b*asin(c*x))/(x*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\mathrm{asin}(c\,x)}{x\,\sqrt{d - c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(1/2)), x)
```

3.116 $\int \frac{a+b\text{ArcSin}(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=66

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{dx}+\frac{bc\sqrt{1-c^2x^2}\,\log(x)}{\sqrt{d-c^2dx^2}}$$

```
[Out] b*c*ln(x)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-(a+b*arcsin(c*x))*(-c^2*d
*x^2+d)^(1/2)/d/x
```

Rubi [A]
time = 0.07, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {4771, 29}

$$\frac{bc\sqrt{1-c^2x^2}\,\log(x)}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{dx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(d*x)) + (b*c*Sqrt[1 - c^2*x^2]
*Log[x])/Sqrt[d - c^2*d*x^2]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx &= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{dx}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x}\,dx}{\sqrt{d-c^2dx^2}}\\ &= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{dx}+\frac{bc\sqrt{1-c^2x^2}\,\log(x)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A]
time = 0.09, size = 69, normalized size = 1.05

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{dx}+\frac{bc\sqrt{d-c^2dx^2}\,\log(x)}{d\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(d*x)) + (b*c*Sqrt[d - c^2*d*x^
2]*Log[x])/(d*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.21, size = 216, normalized size = 3.27

method	result
default	$-\frac{a\sqrt{-c^2d\,x^2+d}}{dx}+\frac{ib\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)c}{d(c^2x^2-1)}-\frac{b\sqrt{-d\,(c^2x^2-1)}\,\arcsin(cx)x\,c^2}{d(c^2x^2-1)}+$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(1/2)+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d
/(c^2*x^2-1)*arcsin(c*x)*c-b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d*x/(c^2*x^
2-1)*c^2+b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d/x/(c^2*x^2-1)-b*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^
2-1)*c
```

Maxima [A]
time = 0.49, size = 104, normalized size = 1.58

$$-\frac{\left((-1)^{-2\,c^2dx^2+2\,d}\,\sqrt{d}\,\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+\sqrt{d}\,\log\left(x^2-\frac{1}{c^2}\right)\right)bc}{2\,d}-\frac{\sqrt{-c^2dx^2+d}\,b\arcsin\left(cx\right)}{dx}-\frac{\sqrt{-c^2dx^2+d}\,a}{dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/2*((-1)^(-2*c^2*d*x^2 + 2*d)*sqrt(d)*log(-2*c^2*d + 2*d/x^2) + sqrt(d)*l
og(x^2 - 1/c^2))*b*c/d - sqrt(-c^2*d*x^2 + d)*b*arcsin(c*x)/(d*x) - sqrt(-c
^2*d*x^2 + d)*a/(d*x)
```

Fricas [A]
time = 5.13, size = 218, normalized size = 3.30

$$\left[\frac{bc\sqrt{d}\,x\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-2\sqrt{-c^2dx^2+d}\,(b\arcsin\left(cx\right)+a)}{2\,dx},\ \frac{bc\sqrt{-d}\,x\arctan\left(\frac{\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)-\sqrt{-c^2dx^2+d}\,(b\arcsin\left(cx\right)+a)}{dx}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*(b*c*sqrt(d)*x*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4 - sqrt(-c^2*d*x^2 +
d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 - x^2)) - 2*sqrt(-c^2
*d*x^2 + d)*(b*arcsin(c*x) + a))/(d*x), (b*c*sqrt(-d)*x*arctan(sqrt(-c^2*d*
x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2
 + d)) - sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(d*x)]
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{(cx)}}{x^2 \sqrt{-d(cx-1)(cx+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x^2\,\sqrt{d - c^2\,d\,x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(1/2)), x)
```

3.117 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=229

$$-\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}+ibc$$

```
[Out] -1/2*b*c*(-c^2*x^2+1)^(1/2)/x/(-c^2*d*x^2+d)^(1/2)-c^2*(a+b*arcsin(c*x))*ar
ctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/2
*I*b*c^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^
2+d)^(1/2)-1/2*I*b*c^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/
2)/(-c^2*d*x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/d/x^2
```

Rubi [A]
time = 0.17, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4789, 4803, 4268, 2317, 2438, 30}

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}+\frac{ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{d-c^2dx^2}}-\frac{ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{2\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(x*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x]))/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + ((I/2)*b*c^2*Sqrt[1 - c
^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((I/2)*b*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2dx^2}+\frac{1}{2}c^2\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x}\cdots}{2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x}\cdots}}{2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int(a+\cdots\right.}{2\sqrt{d-\cdots}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\cdots}{\sqrt{d-c^2dx\cdots}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\cdots}{\sqrt{d-c^2dx\cdots}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\cdots}{\sqrt{d-c^2dx\cdots}}$$

Mathematica [A]
time = 1.59, size = 244, normalized size = 1.07

$$\frac{-\frac{4a\sqrt{d-c^2dx^2}}{x^2}+4ac^2\sqrt{d}\log(x)-4ac^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bc^2d^2(1-c^2x^2)^{3/2}\left(-2\cot\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\text{ArcSin}(cx)\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)+4\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)-4\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)+4i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-4i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)-2\tan\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{(d-c^2dx^2)^{3/2}}}{8d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-4*a*Sqrt[d - c^2*d*x^2])/x^2 + 4*a*c^2*Sqrt[d]*Log[x] - 4*a*c^2*Sqrt[d]*
Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*c^2*d^2*(1 - c^2*x^2)^(3/2)*(-2*C
ot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]*Log[1
- E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (4*I)*Pol
yLog[2, -E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[
c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2)^(3/2))/(
8*d)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 460 vs. 2(225) = 450.
time = 0.22, size = 461, normalized size = 2.01

method	result
default	$-\frac{a\sqrt{-c^2d\,x^2+d}}{2d\,x^2}-\frac{a\,c^2\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{2\sqrt{d}}-\frac{b\sqrt{-d\,(c^2x^2-1)}\,\arcsin(cx)c^2}{2d(c^2x^2-1)}+\frac{b\sqrt{-d\,(c^2x^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(1/2)-1/2*a*c^2/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2
*d*x^2+d)^(1/2))/x)-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*
c^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)/x/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/2*b
*(-d*(c^2*x^2-1))^(1/2)/x^2/d/(c^2*x^2-1)*arcsin(c*x)+1/2*b*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x
^2+1)^(1/2))-1/2*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*
c^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*I*b*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)+1/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polyl
og(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/2*(c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/sqrt(d) +
 sqrt(-c^2*d*x^2 + d)/(d*x^2))*a + b*integrate(arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^3), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{(cx)}}{x^3 \sqrt{-d (cx - 1) (cx + 1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\,\mathrm{asin}(c\,x)}{x^3\,\sqrt{d - c^2\,d\,x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(1/2)), x)
```

3.118 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=147

$$-\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3dx^3}-\frac{2c^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3dx}+\frac{2bc^3\sqrt{1-c^2x^2}\,\log}{3\sqrt{d-c^2dx^2}}$$

```
[Out] -1/6*b*c*(-c^2*x^2+1)^(1/2)/x^2/(-c^2*d*x^2+d)^(1/2)+2/3*b*c^3*ln(x)*(-c^2*
x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)/d/x^3-2/3*c^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/d/x
```

Rubi [A]
time = 0.14, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4789, 4771, 29, 30}

$$-\frac{2c^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3dx}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3dx^3}-\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}+\frac{2bc^3\sqrt{1-c^2x^2}\,\log(x)}{3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/6*(b*c*Sqrt[1 - c^2*x^2])/(x^2*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x]))/(3*d*x) + (2*b*c^3*Sqrt[1 - c^2*x^2]*Log[x])/(3*Sqrt[d - c^2*d*x^2
])
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3dx^3}+\frac{1}{3}(2c^2)\int \frac{a+b\sin^{-1}(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)}{3\sqrt{d-c^2dx}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3dx^3}-\frac{2c^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(}{3dx}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3dx^3}-\frac{2c^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(}{3dx}$$

Mathematica [A]
time = 0.14, size = 152, normalized size = 1.03

$$\frac{\sqrt{d-c^2dx^2}\left(bcx\sqrt{1-c^2x^2}\,(1+6c^2x^2)+a(2+2c^2x^2-4c^4x^4)+2b(1+c^2x^2-2c^4x^4)\,\mathrm{ArcSin}(cx)\right)}{6dx^3\,(-1+c^2x^2)}+\frac{2bc^3\sqrt{d-c^2dx^2}\,\log(x)}{3d\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*Sqrt[d - c^2*d*x^2]),x]

[Out] (Sqrt[d - c^2*d*x^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(1 + 6*c^2*x^2) + a*(2 + 2*c^
2*x^2 - 4*c^4*x^4) + 2*b*(1 + c^2*x^2 - 2*c^4*x^4)*ArcSin[c*x]))/(6*d*x^3*(
-1 + c^2*x^2)) + (2*b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*d*Sqrt[1 - c^2*x^2
])
```

Maple [C] Result contains complex when optimal does not.
time = 0.37, size = 850, normalized size = 5.78

method	result
default	$a\left(-\frac{\sqrt{-c^2d\,x^2+d}}{3d\,x^3}-\frac{2c^2\sqrt{-c^2d\,x^2+d}}{3dx}\right)+\frac{ib\sqrt{-d\left(c^2x^2-1\right)}\,x^3c^6}{3(3c^4x^4-2c^2x^2-1)d}-\frac{ib\sqrt{-d\left(c^2x^2-1\right)}\,x(-c^2x^2}{3(3c^4x^4-2c^2x^2-1)d}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3/d/x^3*(-c^2*d*x^2+d)^(1/2)-2/3*c^2/d/x*(-c^2*d*x^2+d)^(1/2))+1/3*I*
b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6-1/3*I*b*(-d*(c^2
*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*(-c^2*x^2+1)*c^4-2*I*b*(-d*(c^2*
x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*
c^5+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^4-2*b*(-d*
(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)*c^6-2/3*I*b*(-
d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6+4/3*I*b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c^3-2/
3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^5*c^8+1/3*b*(-d*(c
^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^4-2/3*I*b*(-d*(c
^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c
^3+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*x^2+1)^(1/2
)*c^3+4/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)*
c^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^2*(-c^2*x^2+1)
^(1/2)*c+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(
c*x)-2/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*ln((I*c*
x+(-c^2*x^2+1)^(1/2))^2-1)*c^3
```

Maxima [A]
time = 0.49, size = 124, normalized size = 0.84

$$\frac{1}{6}\left(\frac{4\,c^{2}\log\left(x\right)}{\sqrt{d}}-\frac{1}{\sqrt{d}\,x^{2}}\right)bc-\frac{1}{3}\,b\left(\frac{2\,\sqrt{-c^{2}dx^{2}+d}\,c^{2}}{dx}+\frac{\sqrt{-c^{2}dx^{2}+d}}{dx^{3}}\right)\arcsin\left(cx\right)-\frac{1}{3}\,a\left(\frac{2\,\sqrt{-c^{2}dx^{2}+d}\,c^{2}}{dx}+\frac{\sqrt{-c^{2}dx^{2}+d}}{dx^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/6*(4*c^2*log(x)/sqrt(d) - 1/(sqrt(d)*x^2))*b*c - 1/3*b*(2*sqrt(-c^2*d*x^2
 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3))*arcsin(c*x) - 1/3*a*(2*sqrt
(-c^2*d*x^2 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3))
```

Fricas [A]
time = 4.81, size = 433, normalized size = 2.95

$$\left[\frac{2\left(bc^{5}x^{5}-bc^{3}x^{3}\right)\sqrt{d}\,\log\left(\frac{c^{2}dx^{6}+c^{2}dx^{2}-dx^{4}-\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,\left(x^{4}-1\right)\sqrt{d}-d}{c^{2}x^{4}-x^{2}}\right)-\sqrt{-c^{2}dx^{2}+d}\,\left(bcx^{3}-bcx\right)\sqrt{-c^{2}x^{2}+1}-2\left(2\,ac^{4}x^{4}-ac^{2}x^{2}+\left(2\,bc^{4}x^{4}-bc^{2}x^{2}-b\right)\arcsin\left(cx\right)-a\right)\sqrt{-c^{2}dx^{2}+d}}{6\left(c^{2}dx^{5}-dx^{3}\right)},\frac{4\left(bc^{5}x^{5}-bc^{3}x^{3}\right)\sqrt{-d}\,\arctan\left(\frac{\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,\left(x^{2}+1\right)\sqrt{-d}}{c^{2}dx^{4}-\left(c^{2}+1\right)dx^{2}+d}\right)-\sqrt{-c^{2}dx^{2}+d}\,\left(bcx^{3}-bcx\right)\sqrt{-c^{2}x^{2}+1}-2\left(2\,ac^{4}x^{4}-ac^{2}x^{2}+\left(2\,bc^{4}x^{4}-bc^{2}x^{2}-b\right)\arcsin\left(cx\right)-a\right)\sqrt{-c^{2}dx^{2}+d}}{6\left(c^{2}dx^{5}-dx^{3}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/6*(2*(b*c^5*x^5 - b*c^3*x^3)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4
- sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 -
```

```
x^2)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*x^2 + 1) - 2*(2*a
*c^4*x^4 - a*c^2*x^2 + (2*b*c^4*x^4 - b*c^2*x^2 - b)*arcsin(c*x) - a)*sqrt(
-c^2*d*x^2 + d))/(c^2*d*x^5 - d*x^3), 1/6*(4*(b*c^5*x^5 - b*c^3*x^3)*sqrt(-
d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d
*x^4 - (c^2 + 1)*d*x^2 + d)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(
-c^2*x^2 + 1) - 2*(2*a*c^4*x^4 - a*c^2*x^2 + (2*b*c^4*x^4 - b*c^2*x^2 - b)*
arcsin(c*x) - a)*sqrt(-c^2*d*x^2 + d))/(c^2*d*x^5 - d*x^3)]
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\operatorname{asin}(cx)}{x^4\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\operatorname{asin}(c\,x)}{x^4\,\sqrt{d - c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(1/2)), x)
```

3.119 $\int \frac{x^5(a+b\mathbf{ArcSin}(cx))}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=221

$$-\frac{5bx\sqrt{d-c^2dx^2}}{3c^5d^2\sqrt{1-c^2x^2}}-\frac{bx^3\sqrt{d-c^2dx^2}}{9c^3d^2\sqrt{1-c^2x^2}}+\frac{a+b\text{ArcSin}(cx)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{c^6d^2}-\frac{(d-c^2dx^2)^{3/2}\,(}{3c}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^6/d^3+(a+b*arcsin(c*x))/c^6/d
/(-c^2*d*x^2+d)^(1/2)+2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d^2-5/3*
b*x*(-c^2*d*x^2+d)^(1/2)/c^5/d^2/(-c^2*x^2+1)^(1/2)-1/9*b*x^3*(-c^2*d*x^2+d
)^(1/2)/c^3/d^2/(-c^2*x^2+1)^(1/2)-b*arctanh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^6/
d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.14, antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {272, 45, 4779, 12, 1167, 212}

$$-\frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c^6d^3}+\frac{2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{c^6d^2}+\frac{a+b\text{ArcSin}(cx)}{c^6d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{d-c^2dx^2}\,\tanh^{-1}(cx)}{c^6d^2\sqrt{1-c^2x^2}}-\frac{5bx\sqrt{d-c^2dx^2}}{3c^5d^2\sqrt{1-c^2x^2}}-\frac{bx^3\sqrt{d-c^2dx^2}}{9c^3d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-5*b*x*Sqrt[d - c^2*d*x^2])/(3*c^5*d^2*Sqrt[1 - c^2*x^2]) - (b*x^3*Sqrt[d
- c^2*d*x^2])/(9*c^3*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(c^6*d*Sq
rt[d - c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(c^6*d^2)
- ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^6*d^3) - (b*Sqrt[d - c^2
*d*x^2]*ArcTanh[c*x])/(c^6*d^2*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{x^5(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{x^4(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{4\int \frac{x^3(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^4}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}} \\ &= \frac{x^4(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{4x^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3c^4d^2} - \frac{8\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{3c^4d} \\ &= \frac{bx\sqrt{1-c^2x^2}}{c^5d\sqrt{d-c^2dx^2}} - \frac{bx^3\sqrt{1-c^2x^2}}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{8\sqrt{d-c^2dx^2}\,(a}{3c^6} \\ &= -\frac{5bx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} - \frac{bx^3\sqrt{1-c^2x^2}}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{8\sqrt{d-c^2dx^2}}{3}\end{aligned}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.19, size = 166, normalized size = 0.75

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(bcx\sqrt{1-c^2x^2}\,(15+c^2x^2)+3a(-8+4c^2x^2+c^4x^4)+3b(-8+4c^2x^2+c^4x^4)\,\mathrm{ArcSin}(cx)\right)-9ibc\sqrt{1-c^2x^2}\,F\left(i\sinh^{-1}\left(\sqrt{-c^2}\,x\right)\middle|1\right)\right)}{9c^6\sqrt{-c^2}\,d^2\,(-1+c^2x^2)}$$

Antiderivative was successfully verified.

[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]

[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(15 + c^2*x^2) + 3*a*(-8 + 4*c^2*x^2 + c^4*x^4) + 3*b*(-8 + 4*c^2*x^2 + c^4*x^4)*ArcSin[c*x]) - (9*I)*b*c*Sqrt[1 - c^2*x^2]*EllipticF[I*ArcSinh[Sqrt[-c^2]*x], 1]))/(9*c^6*Sqrt[-c^2]*d^2*(-1 + c^2*x^2))

Maple [C] Result contains complex when optimal does not.
time = 0.36, size = 425, normalized size = 1.92

method	result
default	$a\left(-\frac{x^4}{3c^2d\sqrt{-c^2d\,x^2+d}}+\frac{-\frac{4x^2}{3c^2d\sqrt{-c^2d\,x^2+d}}+\frac{8}{3d\,c^4\sqrt{-c^2d\,x^2+d}}}{c^2}\right)+\frac{b\sqrt{-d\,(c^2x^2-1)}\,\arcsin(cx)}{24d^2c^6(c^2x^2-1)}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a*(-1/3*x^4/c^2/d/(-c^2*d*x^2+d)^(1/2)+4/3/c^2*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2)))+1/24*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*arcsin(c*x)*cos(4*arcsin(c*x))-65/24*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*arcsin(c*x)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^6/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+5/3*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^4/(c^2*x^2-1)*arcsin(c*x)*x^2+31/18*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^6/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)-1/72*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*sin(4*arcsin(c*x))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")

[Out] -1/3*a*(x^4/(sqrt(-c^2*d*x^2 + d)*c^2*d) + 4*x^2/(sqrt(-c^2*d*x^2 + d)*c^4*d) - 8/(sqrt(-c^2*d*x^2 + d)*c^6*d)) - 1/3*(3*sqrt(c*x + 1)*sqrt(-c*x + 1)*c^6*d^2*integrate(1/3*(c^4*x^6 + 4*c^2*x^4 - 8*x^2)/(c^7*d^2*x^4 - c^5*d^2*x^2 + (c^5*d^2*x^2 - c^3*d^2)*e^(log(c*x + 1) + log(-c*x + 1))), x) + (c^4*x^4 + 4*c^2*x^2 - 8)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(sqrt(c*x + 1)*sqrt(-c*x + 1)*c^6*d^(3/2))

Fricas [A]
time = 2.61, size = 441, normalized size = 2.00

$$\left[\frac{9\,(bc^2x^2-b)\sqrt{d}\,\log\left(-\frac{c^6dx^6+5\,c^4dx^4-5\,c^2dx^2+4\,(c^3x^3+cx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,\sqrt{d}-d}{c^6x^6-3\,c^4x^4+3\,c^2x^2-1}\right)+4\,(bc^3x^3+15\,bcx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+12\,(ac^4x^4+4\,ac^2x^2+(bc^4x^4+4\,bc^2x^2-8\,b)\arcsin(cx)-8\,a)\sqrt{-c^2dx^2+d}}{36\,(c^8d^2x^2-c^6d^2)},-\frac{9\,(bc^2x^2-b)\sqrt{-d}\,\arctan\left(\frac{2\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,c\sqrt{-d}\,x}{c^4dx^4-d}\right)-2\,(bc^3x^3+15\,bcx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}-6\,(ac^4x^4+4\,ac^2x^2+(bc^4x^4+4\,bc^2x^2-8\,b)\arcsin(cx)-8\,a)\sqrt{-c^2dx^2+d}}{18\,(c^8d^2x^2-c^6d^2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/36*(9*(b*c^2*x^2 - b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^
2 + 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/
(c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) + 4*(b*c^3*x^3 + 15*b*c*x)*sqrt(-c^2
*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 12*(a*c^4*x^4 + 4*a*c^2*x^2 + (b*c^4*x^4 +
 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^2*x^2 -
 c^6*d^2), -1/18*(9*(b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*
sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) - 2*(b*c^3*x^3 + 15*b*c*x)
*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(a*c^4*x^4 + 4*a*c^2*x^2 + (b*
c^4*x^4 + 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*
d^2*x^2 - c^6*d^2)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5(a+b\,\mathrm{asin}\,(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{\left(d-c^2\,d\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.120 $\int \frac{x^4(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=214

$$-\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\text{ArcSin}(cx))}{c^2d\sqrt{d-c^2dx^2}}+\frac{3x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2c^4d^2}-\frac{3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(c$$

```
[Out] x^3*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/4*b*x^2*(-c^2*x^2+1)^(1/
2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-3/4*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/
c^5/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^5/d/(-
c^2*d*x^2+d)^(1/2)+3/2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A]
time = 0.19, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4791, 4795, 4737, 30, 272, 45}

$$\frac{x^3(a+b\text{ArcSin}(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc^5d\sqrt{d-c^2dx^2}}+\frac{3x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2c^4d^2}+\frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2c^5d\sqrt{d-c^2dx^2}}-\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -1/4*(b*x^2*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*Ar
cSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x]))/(2*c^4*d^2) - (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b
*c^5*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(2*c^5
*d*Sqrt[d - c^2*d*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^4(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{x^3(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^3}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}\\
&= \frac{x^3(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2c^4d^2} - \frac{3\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{2c^4d} -\\
&= -\frac{3bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2c^4d^2} -\\
&= -\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2c^4d^2} -
\end{aligned}$$

Mathematica [A]
time = 0.30, size = 173, normalized size = 0.81

$$\frac{-4ac\sqrt{d}\,x(-3+c^2x^2)+12a\sqrt{d-c^2dx^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+b\sqrt{d}\left(8cx\mathrm{ArcSin}(cx)+\sqrt{1-c^2x^2}\,(-6\mathrm{ArcSin}(cx)^2+\cos(2\mathrm{ArcSin}(cx))+4\log(1-c^2x^2)+2\mathrm{ArcSin}(cx)\sin(2\mathrm{ArcSin}(cx)))\right)}{8c^5d^{3/2}\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a*c*Sqrt[d]*x*(-3 + c^2*x^2) + 12*a*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqr
t[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b*Sqrt[d]*(8*c*x*ArcSin[c*x]
+ Sqrt[1 - c^2*x^2]*(-6*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 4*Log[1 - c^2*
x^2] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])))/(8*c^5*d^(3/2)*Sqrt[d - c^2*d*x^
2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.36, size = 432, normalized size = 2.02

method	result
default	$-\frac{a\,x^3}{2c^2d\sqrt{-c^2d\,x^2+d}}+\frac{3ax}{2c^4d\sqrt{-c^2d\,x^2+d}}-\frac{3a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^4d\sqrt{c^2d}}+\frac{3b\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-}}{4c^5d^2(c^2x^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a*x^3/c^2/d/(-c^2*d*x^2+d)^(1/2)+3/2*a/c^4*x/d/(-c^2*d*x^2+d)^(1/2)-3/
2*a/c^4/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+3/4*b*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)^2
+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c
*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)-1/16*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/c^5/d^2/(c^2*x^2-1)-9/8*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/c^4*arcs
in(c*x)*x-1/16*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*cos(3*arcsin(c*
x))-1/8*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcs
in(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*a*(x^3/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 3*x/(sqrt(-c^2*d*x^2 + d)*c^4*d)
 + 3*arcsin(c*x)/(c^5*d^(3/2))) - b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))/((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d
)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*
c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a + b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{\left(d-c^2\,d\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.121 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=142

$$-\frac{bx\sqrt{d-c^2dx^2}}{c^3d^2\sqrt{1-c^2x^2}}+\frac{a+b\text{ArcSin}(cx)}{c^4d\sqrt{d-c^2dx^2}}+\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{c^4d^2}-\frac{b\sqrt{d-c^2dx^2}\,\tanh^{-1}(cx)}{c^4d^2\sqrt{1-c^2x^2}}$$

```
[Out] (a+b*arcsin(c*x))/c^4/d/(-c^2*d*x^2+d)^(1/2)+(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)/c^4/d^2-b*x*(-c^2*d*x^2+d)^(1/2)/c^3/d^2/(-c^2*x^2+1)^(1/2)-b*arct
anh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^4/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.11, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {272, 45, 4779, 12, 396, 212}

$$\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{c^4d^2}+\frac{a+b\text{ArcSin}(cx)}{c^4d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{d-c^2dx^2}\,\tanh^{-1}(cx)}{c^4d^2\sqrt{1-c^2x^2}}-\frac{bx\sqrt{d-c^2dx^2}}{c^3d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((b*x*Sqrt[d - c^2*d*x^2])/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*
x])/(c^4*d*Sqrt[d - c^2*d*x^2]) + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(c^4*d^2) - (b*Sqrt[d - c^2*d*x^2]*ArcTanh[c*x])/(c^4*d^2*Sqrt[1 - c^2*x^2
])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x^2(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{2\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^2}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{c^4d^2} - \frac{\Big(b\sqrt{}}{}$$

$$= -\frac{bx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{c^4d^2} - \frac{b\sqrt{}}{}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.14, size = 136, normalized size = 0.96

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(-2a+ac^2x^2+bcx\sqrt{1-c^2x^2}+b(-2+c^2x^2)\,\mathrm{ArcSin}(cx)\right)-ibc\sqrt{1-c^2x^2}\,F\left(i\sinh^{-1}\left(\sqrt{-c^2}\,x\right)\middle|1\right)\right)}{c^4\sqrt{-c^2}\,d^2\,(-1+c^2x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(-2*a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2
] + b*(-2 + c^2*x^2)*ArcSin[c*x]) - I*b*c*Sqrt[1 - c^2*x^2]*EllipticF[I*Arc
Sinh[Sqrt[-c^2]*x], 1]))/(c^4*Sqrt[-c^2]*d^2*(-1 + c^2*x^2))

Maple [C] Result contains complex when optimal does not.
time = 0.25, size = 307, normalized size = 2.16

method	result
default	$a\left(-\frac{x^{2}}{c^{2} d \sqrt{-c^{2} d\,x^{2}+d}}+\frac{2}{d\,c^{4} \sqrt{-c^{2} d\,x^{2}+d}}\right)+\frac{b \sqrt{-d\left(c^{2} x^{2}-1\right)}\, \arcsin(c x) x^{2}}{c^{2} d^{2}\left(c^{2} x^{2}-1\right)}+\frac{b \sqrt{-d\left(c^{2} x^{2}-1\right)}}{c^{3} d^{2}\left(c^{2}\right.}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2))+b*(-d*(c^2
*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2+b*(-d*(c^2*x^2-1))^(1/2)
/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-2*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^
2/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^4/d
^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)

Maxima [A]
time = 0.49, size = 142, normalized size = 1.00

$$-\frac{1}{2}\,bc\left(\frac{2\,x}{c^{4}d^{\frac{3}{2}}}+\frac{\log\left(cx+1\right)}{c^{5}d^{\frac{3}{2}}}-\frac{\log\left(cx-1\right)}{c^{5}d^{\frac{3}{2}}}\right)-b\left(\frac{x^{2}}{\sqrt{-c^{2}dx^{2}+d}\,c^{2}d}-\frac{2}{\sqrt{-c^{2}dx^{2}+d}\,c^{4}d}\right)\arcsin\left(cx\right)-a\left(\frac{x^{2}}{\sqrt{-c^{2}dx^{2}+d}\,c^{2}d}-\frac{2}{\sqrt{-c^{2}dx^{2}+d}\,c^{4}d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")

[Out] -1/2*b*c*(2*x/(c^4*d^(3/2)) + log(c*x + 1)/(c^5*d^(3/2)) - log(c*x - 1)/(c^
5*d^(3/2))) - b*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)
*c^4*d))*arcsin(c*x) - a*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d
*x^2 + d)*c^4*d))

Fricas [A]
time = 3.07, size = 382, normalized size = 2.69

$$\left[\frac{4\,\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,bcx+\left(bc^{2}x^{2}-b\right)\sqrt{d}\,\log\left(-\frac{c^{6}dx^{6}+5\,c^{4}dx^{4}-5\,c^{2}dx^{2}+4\,\left(c^{3}x^{3}+cx\right)\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,\sqrt{d}-d}{c^{6}x^{6}-3\,c^{4}x^{4}+3\,c^{2}x^{2}-1}\right)+4\,\left(ac^{2}x^{2}+\left(bc^{2}x^{2}-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{-c^{2}dx^{2}+d}}{4\,\left(c^{6}d^{2}x^{2}-c^{4}d^{2}\right)},\ \frac{2\,\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,bcx-\left(bc^{2}x^{2}-b\right)\sqrt{-d}\,\arctan\left(\frac{2\,\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,c\sqrt{-d}\,x}{c^{4}dx^{4}-d}\right)+2\,\left(ac^{2}x^{2}+\left(bc^{2}x^{2}-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{-c^{2}dx^{2}+d}}{2\,\left(c^{6}d^{2}x^{2}-c^{4}d^{2}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")

[Out] [1/4*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x + (b*c^2*x^2 - b)*sqr
t(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 + 4*(c^3*x^3 + c*x)*sqrt(-
c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 - 3*c^4*x^4 + 3*c^2

```
*x^2 - 1)) + 4*(a*c^2*x^2 + (b*c^2*x^2 - 2*b)*arcsin(c*x) - 2*a)*sqrt(-c^2*
d*x^2 + d))/(c^6*d^2*x^2 - c^4*d^2), 1/2*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*
x^2 + 1)*b*c*x - (b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqr
t(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) + 2*(a*c^2*x^2 + (b*c^2*x^2 -
 2*b)*arcsin(c*x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^6*d^2*x^2 - c^4*d^2)]
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.122 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=135

$$\frac{x(a+b\text{ArcSin}(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2c^3d\sqrt{d-c^2dx^2}}$$

```
[Out] x*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))^2*(-c^
2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*ln(-c^2*x^2+1)*(-c^2*x^2+
1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4791, 4737, 266}

$$\frac{x(a+b\text{ArcSin}(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2c^3d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(2*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]
*Log[1 - c^2*x^2])/(2*c^3*d*Sqrt[d - c^2*d*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
```

```
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\sin^{-1}(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2c^3d\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 0.13, size = 160, normalized size = 1.19

$$-\frac{ax\sqrt{-d(-1+c^2x^2)}}{c^2d^2(-1+c^2x^2)} + \frac{a\text{ArcTan}\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right)}{c^3d^{3/2}} + \frac{b\left(2cx\text{ArcSin}(cx) - \sqrt{1-c^2x^2}\left(\text{ArcSin}(cx)^2 - 2\log\left(\sqrt{1-c^2x^2}\right)\right)\right)}{2c^3d\sqrt{d(1-c^2x^2)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((a*x*Sqrt[-(d*(-1 + c^2*x^2))])/(c^2*d^2*(-1 + c^2*x^2))) + (a*ArcTan[(c*
x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^3*d^(3/2)) + (b*
(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2 - 2*Log[Sqrt[1 - c^2*
x^2]])))/(2*c^3*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [C] Result contains complex when optimal does not.
time = 0.16, size = 274, normalized size = 2.03

method	result
default	$\frac{ax}{c^2d\sqrt{-c^2d\,x^2+d}} - \frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}} + \frac{b\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{2d^2c^3(c^2x^2-1)} + \frac{ib\sqrt{-}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*x/c^2/d/(-c^2*d*x^2+d)^(1/2)-a/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))+1/2*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/
```

```
c^3/(c^2*x^2-1)*arcsin(c*x)^2+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/c
^2/(c^2*x^2-1)*x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x
^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] a*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) - b*integrat
e(x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^2*d*x^2 - d)*sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^4*d^2*x^4 - 2*
c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a + b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.123 $\int \frac{x(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=73

$$\frac{a+b\text{ArcSin}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[Out] (a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-b*arctanh(c*x)*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.05, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {4767, 212}

$$\frac{a+b\text{ArcSin}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (GtQ[a, 0] || LtQ[b, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{a+b\sin^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}\\ &= \frac{a+b\sin^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 51, normalized size = 0.70

$$\frac{a+b\text{ArcSin}(cx)-b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]

[Out] (a + b*ArcSin[c*x] - b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2])

Maple [C] Result contains complex when optimal does not.
time = 0.10, size = 194, normalized size = 2.66

method	result
default	$\frac{a}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)}{c^2d^2(c^2x^2-1)}-\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{-c^2x^2+1}\,\ln\left(icx+\sqrt{-c^2x^2}\right.}{c^2d^2(c^2x^2-1)}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a/c^2/d/(-c^2*d*x^2+d)^(1/2)-b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")

[Out] (sqrt(c*x + 1)*sqrt(-c*x + 1)*c^3*d^2*integrate(x^2/(c^4*d^2*x^4 - c^2*d^2*x^2 + (c^2*d^2*x^2 - d^2)*e^(log(c*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(sqrt(c*x + 1)*sqrt(-c*x + 1)*c^2*d^(3/2)) + a/(sqrt(-c^2*d*x^2 + d)*c^2*d)

Fricas [A]
time = 2.14, size = 279, normalized size = 3.82

$$\left[\frac{(bc^2x^2-b)\sqrt{d}\,\log\left(-\frac{c^6dx^6+5\,c^4dx^4-5\,c^2dx^2+4\,(c^3x^3+cx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,\sqrt{d}-d}{c^6x^6-3\,c^4x^4+3\,c^2x^2-1}\right)-4\,\sqrt{-c^2dx^2+d}\,(b\arcsin(cx)+a)}{4\,(c^4d^2x^2-c^2d^2)},-\frac{(bc^2x^2-b)\sqrt{-d}\,\arctan\left(\frac{2\,\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,c\sqrt{-d}\,x}{c^4dx^4-d}\right)+2\,\sqrt{-c^2dx^2+d}\,(b\arcsin(cx)+a)}{2\,(c^4d^2x^2-c^2d^2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")

[Out] [1/4*((b*c^2*x^2 - b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 + 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 4*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c^4*d^2*x^2 - c^2*d^2), -1/2*((b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) + 2*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c^4*d^2*x^2 - c^2*d^2)]

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a + b \operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)

[Out] Integral(x*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign assumes constant sign by intervals (correct if the argument is real):Check [abs(t_

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a + b\operatorname{asin}(c\,x))}{(d - c^2\,d\,x^2)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)

[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)

3.124 $\int \frac{a+b\textbf{ArcSin}(cx)}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=80

$$\frac{x(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2cd\sqrt{d-c^2dx^2}}$$

```
[Out] x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*ln(-c^2*x^2+1)*(-c^2*x^2+1
)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4745, 266}

$$\frac{x(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2cd\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[
1 - c^2*x^2])/(2*c*d*Sqrt[d - c^2*d*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}\\ &= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2cd\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [**A**]
time = 0.11, size = 77, normalized size = 0.96

$$-\frac{\sqrt{d-c^2dx^2}\left(2acx+2bcx\text{ArcSin}(cx)+b\sqrt{1-c^2x^2}\log\left(-1+c^2x^2\right)\right)}{2cd^2\left(-1+c^2x^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -1/2*(Sqrt[d - c^2*d*x^2]*(2*a*c*x + 2*b*c*x*ArcSin[c*x] + b*Sqrt[1 - c^2*x
^2]*Log[-1 + c^2*x^2]))/(c*d^2*(-1 + c^2*x^2))
```

Maple [**C**] Result contains complex when optimal does not.
time = 0.08, size = 177, normalized size = 2.21

method	result
default	$\frac{ax}{d\sqrt{-c^2d\,x^2+d}}+\frac{ib\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)}{c\,d^2(c^2x^2-1)}-\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)x}{d^2(c^2x^2-1)}-\frac{b\sqrt{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*x/d/(-c^2*d*x^2+d)^(1/2)+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/
d^2/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/(c^2*x
^2-1)*x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^2/(c^2*x^2-1)*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [**A**]
time = 0.49, size = 62, normalized size = 0.78

$$\frac{bx\arcsin\left(cx\right)}{\sqrt{-c^2dx^2+d}\,d}+\frac{ax}{\sqrt{-c^2dx^2+d}\,d}-\frac{b\log\left(x^2-\frac{1}{c^2}\right)}{2\,cd^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] b*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*x/(sqrt(-c^2*d*x^2 + d)*d) - 1
/2*b*log(x^2 - 1/c^2)/(c*d^(3/2))
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^4 - 2*c^2*d^2*
x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\mathrm{asin}(c\,x)}{{\left(d - c^2\,d\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(3/2), x)
```

3.125 $\int \frac{a+b\text{ArcSin}(cx)}{x(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=220

$$\frac{a+b\text{ArcSin}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\,\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c}}{}$$

```
[Out] (a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)-2*(a+b*arcsin(c*x))*arctanh(I*c*x+
(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-b*arctanh(c*x
)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+
1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-I*b*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4793, 4803, 4268, 2317, 2438, 212}

$$\frac{a+b\text{ArcSin}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\,\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])/(d*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1
 - c^2*x^2]*ArcTanh[c*x])/(d*Sqrt[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*
PolyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2
*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{d}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\,\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\,\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int (a+bx)\csc(x)\,a\right.}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}}{d\sqrt{d-}}$$

$$= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}}{d\sqrt{d-}}$$

$$= \frac{a+b\sin^{-1}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}}{d\sqrt{d-}}$$

Mathematica [A]
time = 0.65, size = 300, normalized size = 1.36

$$\frac{-\frac{a\sqrt{d-c^2dx^2}}{-1+c^2x^2}+a\sqrt{d}\log(x)-a\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bd\left(\mathrm{ArcSin}(cx)+\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)-\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)+\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)-\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)+i\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)-i\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{d-c^2dx^2}}}{d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-((a*Sqrt[d - c^2*d*x^2])/(-1 + c^2*x^2)) + a*Sqrt[d]*Log[x] - a*Sqrt[d]*L
og[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d*(ArcSin[c*x] + Sqrt[1 - c^2*x^2]
*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log
[1 + E^(I*ArcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]] + I*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*Sqrt[1 - c^2*x
^2]*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2])/d^2
```

Maple [A]
time = 0.15, size = 344, normalized size = 1.56

method	result
default	$\frac{a}{d\sqrt{-c^2d\,x^2+d}}-\frac{a\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}-\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)}{d^2(c^2x^2-1)}+\frac{b\sqrt{-c^2x^2+1}\,\sqrt{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a/d/(-c^2*d*x^2+d)^(1/2)-a/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/
x)-b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)+b*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1
)^(1/2))-2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*ar
ctan(I*c*x+(-c^2*x^2+1)^(1/2))-I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)/d^2/(c^2*x^2-1)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b*(-c^2*x^2+1)^(1/2)*
(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -a*(log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2) - 1/(sq
rt(-c^2*d*x^2 + d)*d)) - b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))/((c^2*d*x^3 - d*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^5 - 2*c^2*d^2*
x^3 + d^2*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{x \left(-d \left(cx - 1\right) \left(cx + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,{\left(d-c^2\,d\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(3/2)), x)
```

3.126 $\int \frac{a+b\textbf{ArcSin}(cx)}{x^2(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=150

$$-\frac{a+b\text{ArcSin}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{d-c^2dx^2}\,\log(x)}{d^2\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\,\log(1-c^2x^2)}{2d^2\sqrt{1-c^2x^2}}$$

```
[Out] (-a-b*arcsin(c*x))/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2*x*(a+b*arcsin(c*x))/d/(-c
^2*d*x^2+d)^(1/2)+b*c*ln(x)*(-c^2*d*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)+1/2
*b*c*ln(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {277, 197, 4779, 12, 457, 78}

$$\frac{2c^2x(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{a+b\text{ArcSin}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{d^2\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\,\log(1-c^2x^2)}{2d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin[c
*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[x])/(d^2*Sqrt[
1 - c^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[1 - c^2*x^2])/(2*d^2*Sqrt[1 -
c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x(1-c^2x^2)}\,dx}{d\sqrt{d-c^2dx^2}}\\ &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{1}{x(1-c^2x)}\,dx\right.}{2d\sqrt{d-c^2dx^2}}\\ &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{d\sqrt{d-c^2dx^2}}+\frac{(bc\sqrt{}}{}\\ &= -\frac{a+b\sin^{-1}(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}\log(x)}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{1-c^2x^2}}{2d\sqrt{d}}\end{aligned}$$

Mathematica [A]
time = 0.15, size = 117, normalized size = 0.78

$$-\frac{\sqrt{d-c^2dx^2}\left(-2a+4ac^2x^2+2b(-1+2c^2x^2)\text{ArcSin}(cx)+bcx\sqrt{1-c^2x^2}\log\left(x^2\right)+bcx\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)\right)}{2d^2x\left(-1+c^2x^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/2*(Sqrt[d - c^2*d*x^2]*(-2*a + 4*a*c^2*x^2 + 2*b*(-1 + 2*c^2*x^2)*ArcSin
[c*x] + b*c*x*Sqrt[1 - c^2*x^2]*Log[x^2] + b*c*x*Sqrt[1 - c^2*x^2]*Log[1 -
c^2*x^2]))/(d^2*x*(-1 + c^2*x^2))
```

Maple [C] Result contains complex when optimal does not.
time = 0.20, size = 240, normalized size = 1.60

method	result
default	$a\left(-\frac{1}{dx\sqrt{-c^{2}d\,x^{2}+d}}+\frac{2c^{2}x}{d\sqrt{-c^{2}d\,x^{2}+d}}\right)+\frac{2ib\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\sqrt{-c^{2}x^{2}+1}\,\arcsin(cx)c}{d^{2}(c^{2}x^{2}-1)}-\frac{2b\sqrt{-d}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2/d*x/(-c^2*d*x^2+d)^(1/2))+2*I*b*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*c-2*b*(-d*(
c^2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)/d^2*x*c^2+b*(-d*(c^2*x^2-1))^(1/2
)*arcsin(c*x)/(c^2*x^2-1)/d^2/x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/d^2/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^4-1)*c
```

Maxima [A]
time = 0.50, size = 129, normalized size = 0.86

$$\frac{1}{2}\,bc\left(\frac{\log\left(cx+1\right)}{d^{\frac{3}{2}}}+\frac{\log\left(cx-1\right)}{d^{\frac{3}{2}}}+\frac{2\,\log\left(x\right)}{d^{\frac{3}{2}}}\right)+\left(\frac{2\,c^{2}x}{\sqrt{-c^{2}dx^{2}+d}\,d}-\frac{1}{\sqrt{-c^{2}dx^{2}+d}\,dx}\right)b\arcsin\left(cx\right)+\left(\frac{2\,c^{2}x}{\sqrt{-c^{2}dx^{2}+d}\,d}-\frac{1}{\sqrt{-c^{2}dx^{2}+d}\,dx}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*b*c*(log(c*x + 1)/d^(3/2) + log(c*x - 1)/d^(3/2) + 2*log(x)/d^(3/2)) +
(2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*b*arcsin(
c*x) + (2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^6 - 2*c^2*d^2*
x^4 + d^2*x^2), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x^2 (-d (cx - 1) (cx + 1))^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))/(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b \operatorname{asin}(c\, x)}{x^2 \left(d - c^2\, d\, x^2\right)^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(3/2)), x)
```

3.127 $\int \frac{a+b\text{ArcSin}(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=316

$$-\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\text{ArcSin}(cx))}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\text{ArcSin}(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{3c^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{i\text{A}\cdots}\right.}{d\sqrt{d-c^2dx^2}}$$

```
[Out] 3/2*c^2*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)+1/2*(-a-b*arcsin(c*x))/d/x
^2/(-c^2*d*x^2+d)^(1/2)-1/2*b*c*(-c^2*x^2+1)^(1/2)/d/x/(-c^2*d*x^2+d)^(1/2)
-3*c^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/
2)/d/(-c^2*d*x^2+d)^(1/2)-b*c^2*arctanh(c*x)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x
^2+d)^(1/2)+3/2*I*b*c^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(
1/2)/d/(-c^2*d*x^2+d)^(1/2)-3/2*I*b*c^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.26, antiderivative size = 316, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$,
Rules used = {4789, 4793, 4803, 4268, 2317, 2438, 212, 331}

$$\frac{3c^2(a+b\text{ArcSin}(cx))}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\text{ArcSin}(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{3c^2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{2d\sqrt{d-c^2dx^2}}-\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{2d\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}-\frac{bc^2\sqrt{1-c^2x^2}\,\tanh^{-1}(cx)}{d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d*x*Sqrt[d - c^2*d*x^2]) + (3*c^2*(a + b*ArcS
in[c*x]))/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])/(2*d*x^2*Sqrt[d -
 c^2*d*x^2]) - (3*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*Ar
cSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x
])/(d*Sqrt[d - c^2*d*x^2]) + (((3*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2,
-E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (((3*I)/2)*b*c^2*Sqrt[1 - c^
2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
```

x]

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}} + \frac{1}{2}\left(3c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^2(1-c^2x^2)}}{2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\sin^{-1}(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}} + \frac{\left(3c^2\right)\int \frac{a+b\sin^{-1}}{x\sqrt{d-c^2}}}{2d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\sin^{-1}(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}} - \frac{bc^2\sqrt{1-c^2x^2}\ \text{ta}}{d\sqrt{d-c^2d}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\sin^{-1}(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}} - \frac{bc^2\sqrt{1-c^2x^2}\ \text{ta}}{d\sqrt{d-c^2d}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\sin^{-1}(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}} - \frac{3c^2\sqrt{1-c^2x^2}\,(a}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\sin^{-1}(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}} - \frac{3c^2\sqrt{1-c^2x^2}\,(a}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\sin^{-1}(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{2dx^2\sqrt{d-c^2dx^2}} - \frac{3c^2\sqrt{1-c^2x^2}\,(a}{}$$

Mathematica [A]
time = 1.40, size = 404, normalized size = 1.28

$$\frac{\frac{4a\sqrt{d}(-1+3c^2x^2)}{x^2\sqrt{d-c^2dx^2}} + 12ac^2\log(x) - 12ac^2\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{b\sqrt{d}\left(2\text{ArcSin}(cx) - 6\text{ArcSin}(cx)\cos(2\text{ArcSin}(cx)) - 3\text{ArcSin}(cx)\cos(3\text{ArcSin}(cx))\log\left(1-e^{i\text{ArcSin}(cx)}\right) + 3\text{ArcSin}(cx)\cos(3\text{ArcSin}(cx))\log\left(1+e^{i\text{ArcSin}(cx)}\right) - 2\cos(3\text{ArcSin}(cx))\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) + \sqrt{1-c^2x^2}\left(3\text{ArcSin}(cx)\left(\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\log\left(1+e^{i\text{ArcSin}(cx)}\right)\right)+2\left(\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)\right) + 2\cos(3\text{ArcSin}(cx))\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) - 2\sin(2\text{ArcSin}(cx)) + 6icx\,\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)\sin(2\text{ArcSin}(cx)) - 6icx\,\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\sin(2\text{ArcSin}(cx))\right)}{x^2\sqrt{d-c^2dx^2}}}{8d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] ((4*a*Sqrt[d]*(-1 + 3*c^2*x^2))/(x^2*Sqrt[d - c^2*d*x^2]) + 12*a*c^2*Log[x]
 - 12*a*c^2*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*Sqrt[d]*(2*ArcSin[c*x
] - 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log
[1 - E^(I*ArcSin[c*x])] + 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*Arc
Sin[c*x])] - 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]] + Sqrt[1 - c^2*x^2]*(3*ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1
+ E^(I*ArcSin[c*x])]) + 2*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])) + 2*Cos[3*ArcSin[c*x]]*Log[Co
```

```
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sin[2*ArcSin[c*x]] + (6*I)*c*x*P
olyLog[2, -E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - (6*I)*c*x*PolyLog[2, E^(
I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]]))/(x^2*Sqrt[d - c^2*d*x^2]))/(8*d^(3/2))
```

Maple [A]
time = 0.23, size = 474, normalized size = 1.50

method	result
default	$-\frac{a}{2 d\,x^{2} \sqrt{-c^{2} d\,x^{2}+d}}+\frac{3 a\,c^{2}}{2 d \sqrt{-c^{2} d\,x^{2}+d}}-\frac{3 a\,c^{2} \ln \left(\frac{2 d+2 \sqrt{d}\, \sqrt{-c^{2} d\,x^{2}+d}}{x}\right)}{2 d^{\frac{3}{2}}}-\frac{3 b \sqrt{-d\left(c^{2} x^{2}-1\right.}}{2 d^{2}\left(c^{2} x^{2}-\right.}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2/(-c^2*d*x^2+d)^(1/2)+3/2*a*c^2/d/(-c^2*d*x^2+d)^(1/2)-3/2*a*c^
2/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-3/2*b*(-d*(c^2*x^2-1))
^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*c^2+1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^
2*x^2-1)/x*(-c^2*x^2+1)^(1/2)*c+1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1
)/x^2*arcsin(c*x)+3/2*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-
1)/d^2*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arctan(I*c*x+(-c^2*x^2+1)^(1
/2))-3/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*
dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)/d^2*c^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*(3*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2)
 - 3*c^2/(sqrt(-c^2*d*x^2 + d)*d) + 1/(sqrt(-c^2*d*x^2 + d)*d*x^2))*a - b*i
ntegrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^2*d*x^5 - d*x^3)*sq
rt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^7 - 2*c^2*d^2*
x^5 + d^2*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x^3 \left(-d(cx-1)(cx+1)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x^3\,{\left(d - c^2\,d\,x^2\right)}^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(3/2)), x)
```

3.128 $\int \frac{a+b\text{ArcSin}(cx)}{x^4(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=238

$$-\frac{bc\sqrt{d-c^2dx^2}}{6d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\text{ArcSin}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\text{ArcSin}(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\text{ArcSin}(cx))}{3d\sqrt{d-c^2dx^2}}+\frac{5bc^3\sqrt{d-c^2dx^2}}{3d^2\sqrt{1-c^2x}}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3/(-c^2*d*x^2+d)^(1/2)-4/3*c^2*(a+b*arcsin(c*x))
/d/x/(-c^2*d*x^2+d)^(1/2)+8/3*c^4*x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2
)-1/6*b*c*(-c^2*d*x^2+d)^(1/2)/d^2/x^2/(-c^2*x^2+1)^(1/2)+5/3*b*c^3*ln(x)*(
-c^2*d*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)+1/2*b*c^3*ln(-c^2*x^2+1)*(-c^2*d
*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.14, antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {277, 197, 4779, 12, 1265, 907}

$$-\frac{4c^2(a+b\text{ArcSin}(cx))}{3dx\sqrt{d-c^2dx^2}}-\frac{a+b\text{ArcSin}(cx)}{3dx^3\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\text{ArcSin}(cx))}{3d\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^2x^2\sqrt{1-c^2x^2}}+\frac{5bc^3\log(x)\sqrt{d-c^2dx^2}}{3d^2\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}\,\log(1-c^2x^2)}{2d^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[d - c^2*d*x^2])/(d^2*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[
c*x])/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x]))/(3*d*x*Sq
rt[d - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*Sqrt[d - c^2*d*x^2]
) + (5*b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*d^2*Sqrt[1 - c^2*x^2]) + (b*c^3
*Sqrt[d - c^2*d*x^2]*Log[1 - c^2*x^2])/(2*d^2*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}+\frac{1}{3}\left(4c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^3(1-c^2x}}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\sin^{-1}(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{1}{3}\left(8c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{}\right.}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\sin^{-1}(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\sin^{-1}(cx))}{3d\sqrt{d-c^2dx^2}}+\frac{\left(bc\sqrt{1-c^2}\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\sin^{-1}(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\sin^{-}}{3d\sqrt{d-c^2dx}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2\sqrt{d-c^2dx^2}}-\frac{a+b\sin^{-1}(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\sin^{-1}(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\sin^{-}}{3d\sqrt{d-c^2dx}}$$

Mathematica [**A**]

time = 0.20, size = 162, normalized size = 0.68

$$\frac{\sqrt{d-c^2dx^2}\left(2a+8ac^2x^2-16ac^4x^4+bcx\sqrt{1-c^2x^2}+2b(1+4c^2x^2-8c^4x^4)\,\mathrm{ArcSin}(cx)-5bc^3x^3\sqrt{1-c^2x^2}\,\log\left(x^2\right)-3bc^3x^3\sqrt{1-c^2x^2}\,\log\left(1-c^2x^2\right)\right)}{6d^2x^3\left(-1+c^2x^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(2*a + 8*a*c^2*x^2 - 16*a*c^4*x^4 + b*c*x*Sqrt[1 - c^2
*x^2] + 2*b*(1 + 4*c^2*x^2 - 8*c^4*x^4)*ArcSin[c*x] - 5*b*c^3*x^3*Sqrt[1 -
c^2*x^2]*Log[x^2] - 3*b*c^3*x^3*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]))/(6*d^2
*x^3*(-1 + c^2*x^2))
```

Maple [C] Result contains complex when optimal does not.
time = 0.39, size = 1048, normalized size = 4.40

method	result
default	$a\left(-\frac{1}{3d\,x^3\sqrt{-c^2d\,x^2+d}}+\frac{4c^2\left(-\frac{1}{dx\sqrt{-c^2d\,x^2+d}}+\frac{2c^2x}{d\sqrt{-c^2d\,x^2+d}}\right)}{3}\right)-\frac{16ib\sqrt{-d\left(c^2x^2-1\right)}\,x^5}{\left(8c^4x^4-7c^2x^2-1\right)d^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3/d/x^3/(-c^2*d*x^2+d)^(1/2)+4/3*c^2*(-1/d/x/(-c^2*d*x^2+d)^(1/2)+2*c
^2/d*x/(-c^2*d*x^2+d)^(1/2)))-16*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^
2*x^2-1)/d^2*x^5*c^8-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)
/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4
*x^4-7*c^2*x^2-1)/d^2*x^3*c^6+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c
^2*x^2-1)/d^2*x*c^4-4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/
d^2*x*(-c^2*x^2+1)*c^4-16/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2
-1)/d^2*x^3*(-c^2*x^2+1)*c^6-64/3*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2
*x^2-1)/d^2*x^3*arcsin(c*x)*c^6+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-
7*c^2*x^2-1)/d^2*x^7*c^10+16/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/d^2/(c^2*x^2-1)*arcsin(c*x)*c^3+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^
4-7*c^2*x^2-1)/d^2*x^5*(-c^2*x^2+1)*c^8+8*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x
^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*c^4-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^
4*x^4-7*c^2*x^2-1)/d^2*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+4/3*b*(-d*(c^
2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*c^3+4*b*(-d*
(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)*c^2+1/6*b*(-d*
(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^2*(-c^2*x^2+1)^(1/2)*c+1/3
*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^3*arcsin(c*x)-b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^
2+1)^(1/2))^2)*c^3-5/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2
*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/3*(8*c^4*x/(sqrt(-c^2*d*x^2 + d)*d) - 4*c^2/(sqrt(-c^2*d*x^2 + d)*d*x) -
1/(sqrt(-c^2*d*x^2 + d)*d*x^3))*a - b*integrate(arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))/((c^2*d*x^6 - d*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt
(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^8 - 2*c^2*d^2*
x^6 + d^2*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{x^{4} \left(- d \left(cx - 1\right) \left(cx + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**4*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^4), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x^4\,{\left(d - c^2\,d\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(3/2)), x)
```

3.129 $\int \frac{x^6(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=293

$$-\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}}{4c^5d^2\sqrt{d-c^2dx^2}}+\frac{x^5(a+b\text{ArcSin}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}}-\frac{5x^3(a+b\text{ArcSin}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{5x\sqrt{d-}}{}$$

```
[Out] 1/3*x^5*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(3/2)-5/3*x^3*(a+b*arcsin(c*
x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b/c^7/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x
^2+d)^(1/2)+1/4*b*x^2*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+5/4*(
a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^7/d^2/(-c^2*d*x^2+d)^(1/2)-7/6*b*
ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^7/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*x*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d^3
```

Rubi [A]
time = 0.30, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4791, 4795, 4737, 30, 272, 45}

$$\frac{x^5(a+b\text{ArcSin}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}}+\frac{5\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc^7d^2\sqrt{d-c^2dx^2}}-\frac{5x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2c^6d^3}-\frac{5x^3(a+b\text{ArcSin}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}-\frac{7b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{6c^7d^2\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}}{4c^5d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^6*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c^7*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^
2*x^2])/(4*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (x^5*(a + b*ArcSin[c*x]))/(3*c^2*
d*(d - c^2*d*x^2)^(3/2)) - (5*x^3*(a + b*ArcSin[c*x]))/(3*c^4*d^2*Sqrt[d -
c^2*d*x^2]) - (5*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*c^6*d^3) + (
5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c^7*d^2*Sqrt[d - c^2*d*x^2]
) - (7*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(6*c^7*d^2*Sqrt[d - c^2*d*x^2]
)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^6(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^5(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5\int \frac{x^4(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^5}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^5(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5x^3(a+b\sin^{-1}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{5\int \frac{x^2(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{c^4d^2} + \frac{\left(5b\sqrt{1-\right.}{3c^3d^2}$$

$$= \frac{x^5(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5x^3(a+b\sin^{-1}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{5x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{2c^6d^3} +$$

$$= -\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{13bx^2\sqrt{1-c^2x^2}}{12c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^5(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} -$$

$$= -\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{bx^2\sqrt{1-c^2x^2}}{4c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^5(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} -$$

Mathematica [A]
time = 0.42, size = 253, normalized size = 0.86

$$\frac{4bc\sqrt{d}\,x(15-20c^2x^2+3c^4x^4)\,\mathrm{ArcSin}(cx)-30b\sqrt{d}\,(1-c^2x^2)^{3/2}\,\mathrm{ArcSin}(cx)^2-60a(-1+c^2x^2)\sqrt{d-c^2dx^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+\sqrt{d}\left(4acx(15-20c^2x^2+3c^4x^4)+b\sqrt{1-c^2x^2}\,(7-9c^2x^2+6c^4x^4)+28b(1-c^2x^2)^{3/2}\log(1-c^2x^2)\right)}{24c^7d^{5/2}(-1+c^2x^2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^6*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (4*b*c*Sqrt[d]*x*(15 - 20*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x] - 30*b*Sqrt[d]*(
1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 - 60*a*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2]*
ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d]*(4*a*c
*x*(15 - 20*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(7 - 9*c^2*x^2 + 6*c
^4*x^4) + 28*b*(1 - c^2*x^2)^(3/2)*Log[1 - c^2*x^2]))/(24*c^7*d^(5/2)*(-1 +
 c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.39, size = 2245, normalized size = 7.66

method	result	size
default	Expression too large to display	2245

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1177/8*b*(-d*(c^2*x^2-1))^(1/2)*x^5/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^
4-64*c^2*x^2-49)/c^2*arcsin(c*x)-301/24*b*(-d*(c^2*x^2-1))^(1/2)*x^3/d^3/(1
```

11*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)/c^4*arcsin(c*x)-5/4*b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^7/d^3/(c^2*x^2-1)*arcsin(c*x)^2+49
/12*I*b*(-d*(c^2*x^2-1))^(1/2)*x/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-6
4*c^2*x^2-49)/c^6+5/24*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)
/c^6*x-629/8*b*(-d*(c^2*x^2-1))^(1/2)*x^7/d^3/(111*c^8*x^8-384*c^6*x^6+386*
c^4*x^4-64*c^2*x^2-49)*arcsin(c*x)+1/16*b*(-d*(c^2*x^2-1))^(1/2)/c^7/d^3/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)-11/48*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*
c^2*x^2+1)/c^7*(-c^2*x^2+1)^(1/2)-1/4*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x
^4-2*c^2*x^2+1)*x^7+17/2*I*b*(-d*(c^2*x^2-1))^(1/2)*x^7/d^3/(111*c^8*x^8-38
4*c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)-10*I*b*(-d*(c^2*x^2-1))^(1/2)*x^5/d^3/
(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)/c^2*(-c^2*x^2+1)+10*I*b
(-d(c^2*x^2-1))^(1/2)*x^3/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64*c^2
x^2-49)/c^4(-c^2*x^2+1)-14/3*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)/c^7/d^3/(c^2*x^2-1)*arcsin(c*x)-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x
^4-2*c^2*x^2+1)/c^7*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/4*I*b*(-d*(c^2*x^2-1))
^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2*(-c^2*x^2+1)*x^5+3/8*I*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^4*(-c^2*x^2+1)*x^3-1/8*I*b*(-d*(c^2*x
^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^6*(-c^2*x^2+1)*x-5/2*a/c^6/d^2*x/(
-c^2*d*x^2+d)^(1/2)+5/2*a/c^6/d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^
2*d*x^2+d)^(1/2))+5/6*a/c^4*x^3/d/(-c^2*d*x^2+d)^(3/2)-1/2*a*x^5/c^2/d/(-c^
2*d*x^2+d)^(3/2)+5/8*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c
^2*x^5-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^4*x^3-65/
4*I*b*(-d*(c^2*x^2-1))^(1/2)*x^5/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-6
4*c^2*x^2-49)/c^2-14/3*I*b*(-d*(c^2*x^2-1))^(1/2)*x^3/d^3/(111*c^8*x^8-384*
c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)/c^4-37/2*b*(-d*(c^2*x^2-1))^(1/2)*x^6/d^
3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)/c*(-c^2*x^2+1)^(1/2)+
27*b*(-d*(c^2*x^2-1))^(1/2)*x^4/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64
*c^2*x^2-49)/c^3*(-c^2*x^2+1)^(1/2)+49/6*b*(-d*(c^2*x^2-1))^(1/2)*x^2/d^3/(
111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)/c^5*(-c^2*x^2+1)^(1/2)-1
/4*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+11/4
8*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^5*(-c^2*x^2+1)^(1/2)
*x^2-343/24*b*(-d*(c^2*x^2-1))^(1/2)*x/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4
*x^4-64*c^2*x^2-49)/c^6*arcsin(c*x)+7/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+
1)^(1/2)/c^7/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*(-d*(
c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcsin(c*x)*x^3+3/8*b*(-d*(c^2*x^2-1)
)^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)*x-29/12*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(c^4*x^4-2*c^2*x^2+1)/c^6*arcsin(c*x)*x+19/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(c^4*x^4-2*c^2*x^2+1)/c^4*arcsin(c*x)*x^3+19/6*I*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(c^4*x^4-2*c^2*x^2+1)/c^5*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2-185/2*I*b*
(-d*(c^2*x^2-1))^(1/2)*x^6/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64*c^2*
x^2-49)/c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)+135*I*b*(-d*(c^2*x^2-1))^(1/2)*x^4
/d^3/(111*c^8*x^8-384*c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)/c^3*(-c^2*x^2+1)^(
1/2)*arcsin(c*x)+245/6*I*b*(-d*(c^2*x^2-1))^(1/2)*x^2/d^3/(111*c^8*x^8-384*
c^6*x^6+386*c^4*x^4-64*c^2*x^2-49)/c^5*(-c^2*x^2+1)^(1/2)*arcsin(c*x)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/6*a*(3*x^5/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 5*x*(3*x^2/((-c^2*d*x^2 + d)
^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))/c^2 + 5*x/(sqrt(-c^2*d*x^
2 + d)*c^6*d^2) - 15*arcsin(c*x)/(c^7*d^(5/2))) + b*integrate(x^6*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt
(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^6*arcsin(c*x) + a*x^6)*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{6}\left(a+b\operatorname{asin}\left(cx\right)\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**6*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**6*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^6/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^6\,(a+b\,\mathrm{asin}(c\,x))}{\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^6*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^6*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.130 $\int \frac{x^5(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=219

$$-\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3(1-c^2x^2)^{3/2}}+\frac{bx\sqrt{d-c^2dx^2}}{c^5d^3\sqrt{1-c^2x^2}}+\frac{a+b\text{ArcSin}(cx)}{3c^6d(d-c^2dx^2)^{3/2}}-\frac{2(a+b\text{ArcSin}(cx))}{c^6d^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSi}}{c^6d^3}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/c^6/d/(-c^2*d*x^2+d)^(3/2)-2*(a+b*arcsin(c*x))/c^6/d^
2/(-c^2*d*x^2+d)^(1/2)-1/6*b*x*(-c^2*d*x^2+d)^(1/2)/c^5/d^3/(-c^2*x^2+1)^(3
/2)-(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d^3+b*x*(-c^2*d*x^2+d)^(1/2)
/c^5/d^3/(-c^2*x^2+1)^(1/2)+11/6*b*arctanh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^6/d^
3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.14, antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {272, 45, 4779, 12, 1171, 396, 212}

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{c^6d^3}-\frac{2(a+b\text{ArcSin}(cx))}{c^6d^2\sqrt{d-c^2dx^2}}+\frac{a+b\text{ArcSin}(cx)}{3c^6d(d-c^2dx^2)^{3/2}}+\frac{11b\sqrt{d-c^2dx^2}\tanh^{-1}(cx)}{6c^6d^3\sqrt{1-c^2x^2}}+\frac{bx\sqrt{d-c^2dx^2}}{c^5d^3\sqrt{1-c^2x^2}}-\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3(1-c^2x^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*x*Sqrt[d - c^2*d*x^2])/(c^5*d^3*(1 - c^2*x^2)^(3/2)) + (b*x*Sqrt[d
 - c^2*d*x^2])/(c^5*d^3*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(3*c^6*d*(d
 - c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x]))/(c^6*d^2*Sqrt[d - c^2*d*x^2]
) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(c^6*d^3) + (11*b*Sqrt[d - c^
2*d*x^2]*ArcTanh[c*x])/(6*c^6*d^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 1171

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, Simp[(-R)*x*((d + e*x^2)^(q + 1)/(2*d*(q + 1))), x] + Dist[1/(2*d*(q
 + 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x
], x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2
 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{x^5(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^4(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4\int \frac{x^3(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^4}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^3}{6c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4x^2(a+b\sin^{-1}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + $$

$$= -\frac{bx^3}{6c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}}{6c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - $$

$$= -\frac{bx^3}{6c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{5bx\sqrt{1-c^2x^2}}{6c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - $$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.20, size = 169, normalized size = 0.77

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(bcx\sqrt{1-c^2x^2}(-5+6c^2x^2)+2a(8-12c^2x^2+3c^4x^4)+2b(8-12c^2x^2+3c^4x^4)\,\text{ArcSin}(cx)\right)+11ibc(1-c^2x^2)^{3/2}F\left(i\sinh^{-1}\left(\sqrt{-c^2}\,x\right)\middle|1\right)\right)}{6c^4(-c^2)^{3/2}d^3(-1+c^2x^2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(-5 + 6*c^2*x^2)
+ 2*a*(8 - 12*c^2*x^2 + 3*c^4*x^4) + 2*b*(8 - 12*c^2*x^2 + 3*c^4*x^4)*ArcSi
n[c*x]) + (11*I)*b*c*(1 - c^2*x^2)^(3/2)*EllipticF[I*ArcSinh[Sqrt[-c^2]*x],
 1]))/(6*c^4*(-c^2)^(3/2)*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] Result contains complex when optimal does not.
time = 0.35, size = 464, normalized size = 2.12

method	result
default	$a\left(-\frac{x^4}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{\frac{4x^2}{c^2d\left(-c^2dx^2+d\right)^{\frac{3}{2}}}-\frac{8}{3dc^4\left(-c^2dx^2+d\right)^{\frac{3}{2}}}}{c^2}\right)-\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{-c^2x^2+1}\,x}{c^5d^3(c^2x^2-1)}-\frac{b\sqrt{-}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-x^4/c^2/d/(-c^2*d*x^2+d)^(3/2)+4/c^2*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/
3/d/c^4/(-c^2*d*x^2+d)^(3/2)))-b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*x-b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcsin(c
```

```
*x)*x^2+b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)+2*b*(-d*(c
^2*x^2-1))^(1/2)/c^4/(c^2*x^2-1)^2/d^3*arcsin(c*x)*x^2-1/6*b*(-d*(c^2*x^2-1
))^(1/2)/c^5/(c^2*x^2-1)^2/d^3*(-c^2*x^2+1)^(1/2)*x-5/3*b*(-d*(c^2*x^2-1))^
(1/2)/c^6/(c^2*x^2-1)^2/d^3*arcsin(c*x)-11/6*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+11/6*b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x
^2+1)^(1/2)-I)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
[Out] -1/3*a*(3*x^4/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 12*x^2/((-c^2*d*x^2 + d)^(3/
2)*c^4*d) + 8/((-c^2*d*x^2 + d)^(3/2)*c^6*d)) + 1/3*(3*(c^8*d^3*x^2 - c^6*d
^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*integrate(1/3*(3*c^4*x^6 - 12*c^2*
x^4 + 8*x^2)/(c^9*d^3*x^6 - 2*c^7*d^3*x^4 + c^5*d^3*x^2 + (c^7*d^3*x^4 - 2*
c^5*d^3*x^2 + c^3*d^3)*e^(log(c*x + 1) + log(-c*x + 1))), x) + (3*c^4*x^4 -
 12*c^2*x^2 + 8)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/((c^
8*d^3*x^2 - c^6*d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1))
```

Fricas [A]
time = 2.98, size = 481, normalized size = 2.20

$$\left[\frac{11\,(bc^4x^4 - 2\,bc^2x^2 + b)\sqrt{d}\,\log\left(-\frac{c^6dx^6 + 5\,c^4dx^4 - 5\,c^2dx^2 - 4\,(c^3x^3 + cx)\sqrt{-c^2dx^2 + d}\,\sqrt{-c^2x^2 + 1}\,\sqrt{d} - d}{c^6x^6 - 3\,c^4x^4 + 3\,c^2x^2 - 1}\right) - 4\,(6\,bc^3x^3 - 5\,bcx)\sqrt{-c^2dx^2 + d}\,\sqrt{-c^2x^2 + 1} - 8\,(3\,ac^4x^4 - 12\,ac^2x^2 + (3\,bc^4x^4 - 12\,bc^2x^2 + 8\,b)\arcsin(cx) + 8\,a)\sqrt{-c^2dx^2 + d}}{24\,(c^{10}d^3x^4 - 2\,c^8d^3x^2 + c^6d^3)}, \frac{11\,(bc^4x^4 - 2\,bc^2x^2 + b)\sqrt{-d}\,\arctan\left(\frac{2\sqrt{-c^2dx^2 + d}\,\sqrt{-c^2x^2 + 1}\,c\sqrt{-d}\,x}{c^4dx^4 - d}\right) - 2\,(6\,bc^3x^3 - 5\,bcx)\sqrt{-c^2dx^2 + d}\,\sqrt{-c^2x^2 + 1} - 4\,(3\,ac^4x^4 - 12\,ac^2x^2 + (3\,bc^4x^4 - 12\,bc^2x^2 + 8\,b)\arcsin(cx) + 8\,a)\sqrt{-c^2dx^2 + d}}{12\,(c^{10}d^3x^4 - 2\,c^8d^3x^2 + c^6d^3)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
[Out] [1/24*(11*(b*c^4*x^4 - 2*b*c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x
^4 - 5*c^2*d*x^2 - 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1
)*sqrt(d) - d)/(c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 4*(6*b*c^3*x^3 - 5*
b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 8*(3*a*c^4*x^4 - 12*a*c^2*
x^2 + (3*b*c^4*x^4 - 12*b*c^2*x^2 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2
 + d))/(c^10*d^3*x^4 - 2*c^8*d^3*x^2 + c^6*d^3), 1/12*(11*(b*c^4*x^4 - 2*b*
c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sq
rt(-d)*x/(c^4*d*x^4 - d)) - 2*(6*b*c^3*x^3 - 5*b*c*x)*sqrt(-c^2*d*x^2 + d)*
sqrt(-c^2*x^2 + 1) - 4*(3*a*c^4*x^4 - 12*a*c^2*x^2 + (3*b*c^4*x^4 - 12*b*c^
2*x^2 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2 + d))/(c^10*d^3*x^4 - 2*c^8
*d^3*x^2 + c^6*d^3)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5(a + b\,\mathrm{asin}\,(cx))}{(-d\,(cx - 1)\,(cx + 1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.131 $\int \frac{x^4(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=212

$$-\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\text{ArcSin}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}}-\frac{x(a+b\text{ArcSin}(cx))}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx)}{2bc^5d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(3/2)-x*(a+b*arcsin(c*x))/c^
4/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b/c^5/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^
(1/2)+1/2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^5/d^2/(-c^2*d*x^2+d)^(
1/2)-2/3*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {4791, 4737, 266, 272, 45}

$$\frac{x^3(a+b\text{ArcSin}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}}+\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc^5d^2\sqrt{d-c^2dx^2}}-\frac{x(a+b\text{ArcSin}(cx))}{c^4d^2\sqrt{d-c^2dx^2}}-\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{3c^5d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c^5*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin
[c*x]))/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x]))/(c^4*d^2*
Sqrt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c^5*d
^2*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c^5*d
^2*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\int \frac{x^2(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^3}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{x(a+b\sin^{-1}(cx))}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d-c^2dx^2}}\,dx}{c^4d^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)}{c^3d^2\sqrt{d-}}$$

$$= \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{x(a+b\sin^{-1}(cx))}{c^4d^2\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\,\log(1-c^2x^2)}{2c^5d^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-}}{c}$$

$$= -\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{x(a+b\sin^{-1}(cx))}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{}}{}$$

Mathematica [A]
time = 0.29, size = 213, normalized size = 1.00

$$\frac{-3b\sqrt{d}\,(1-c^2x^2)^{3/2}\,\mathrm{ArcSin}(cx)^2 - 6a(-1+c^2x^2)\sqrt{d-c^2dx^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right) + \sqrt{d}\left(6acx - 8ac^3x^3 + b\sqrt{1-c^2x^2} + 4b(1-c^2x^2)^{3/2}\log(1-c^2x^2)\right) + 2b\sqrt{d}\,\mathrm{ArcSin}(cx)\sin(3\mathrm{ArcSin}(cx))}{6c^5d^{5/2}(-1+c^2x^2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-3*b*Sqrt[d]*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 - 6*a*(-1 + c^2*x^2)*Sqrt[d
 - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] +
Sqrt[d]*(6*a*c*x - 8*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 4*b*(1 - c^2*x^2)^(3
/2)*Log[1 - c^2*x^2]) + 2*b*Sqrt[d]*ArcSin[c*x]*Sin[3*ArcSin[c*x]])/(6*c^5*
d^(5/2)*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.38, size = 531, normalized size = 2.50

method	result
default	$\frac{a\,x^{3}}{3c^{2}d\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}-\frac{ax}{c^{4}d^{2}\sqrt{-c^{2}d\,x^{2}+d}}+\frac{a\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{c^{4}d^{2}\sqrt{c^{2}d}}-\frac{b\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\sqrt{-c^{2}x^{2}+}}{2c^{5}d^{3}\left(c^{2}x^{2}-1\right)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a*x^3/c^2/d/(-c^2*d*x^2+d)^(3/2)-a/c^4/d^2*x/(-c^2*d*x^2+d)^(1/2)+a/c^4
/d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*b*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c*x)^2-8/3*
I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c*
x)-4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^5*arcsin(c*x)
*(-c^2*x^2+1)^(1/2)-b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^4*
arcsin(c*x)*x-1/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^5*(-
c^2*x^2+1)^(1/2)+4/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c
^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(c^4*x^4-2*c^2*x^2+1)/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+4/3*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2*arcsin(c*x)*x^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*(x*(3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^
4*d)) - x/(sqrt(-c^2*d*x^2 + d)*c^4*d^2) + 3*arcsin(c*x)/(c^5*d^(5/2)))*a +
 b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 -
 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a+b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.132 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=150

$$-\frac{bx\sqrt{d-c^2dx^2}}{6c^3d^3\left(1-c^2x^2\right)^{3/2}}+\frac{a+b\text{ArcSin}(cx)}{3c^4d\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\text{ArcSin}(cx)}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{5b\sqrt{d-c^2dx^2}\tanh^{-1}(cx)}{6c^4d^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/c^4/d/(-c^2*d*x^2+d)^(3/2)+(-a-b*arcsin(c*x))/c^4/d^2
/(-c^2*d*x^2+d)^(1/2)-1/6*b*x*(-c^2*d*x^2+d)^(1/2)/c^3/d^3/(-c^2*x^2+1)^(3/
2)+5/6*b*arctanh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^4/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {272, 45, 4779, 12, 393, 212}

$$-\frac{a+b\text{ArcSin}(cx)}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{a+b\text{ArcSin}(cx)}{3c^4d\left(d-c^2dx^2\right)^{3/2}}+\frac{5b\sqrt{d-c^2dx^2}\tanh^{-1}(cx)}{6c^4d^3\sqrt{1-c^2x^2}}-\frac{bx\sqrt{d-c^2dx^2}}{6c^3d^3\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*x*Sqrt[d - c^2*d*x^2])/(c^3*d^3*(1 - c^2*x^2)^(3/2)) + (a + b*ArcSi
n[c*x])/(3*c^4*d*(d - c^2*d*x^2)^(3/2)) - (a + b*ArcSin[c*x])/(c^4*d^2*Sqrt
[d - c^2*d*x^2]) + (5*b*Sqrt[d - c^2*d*x^2]*ArcTanh[c*x])/(6*c^4*d^3*Sqrt[1
 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 393

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(-(b*c - a*d))*x*((a + b*x^n)^(p + 1)/(a*b*n*(p + 1))), x] - Dist[(a*d -
 b*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; F
reeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n
 + p, 0])
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^2(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2\int \frac{x(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^2}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx}{6c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\sin^{-1}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{(}{}$$

$$= -\frac{bx}{6c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\sin^{-1}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{5b}{}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.15, size = 143, normalized size = 0.95

$$\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(-4a+6ac^2x^2-bcx\sqrt{1-c^2x^2}+2b(-2+3c^2x^2)\operatorname{ArcSin}(cx)\right)-5ibc(1-c^2x^2)^{3/2}F\left(i\sinh^{-1}\left(\sqrt{-c^2}\,x\right)\middle|1\right)\right)}{6c^4\sqrt{-c^2}\,d^3\left(-1+c^2x^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(-4*a + 6*a*c^2*x^2 - b*c*x*Sqrt[1 - c^2*x
^2] + 2*b*(-2 + 3*c^2*x^2)*ArcSin[c*x]) - (5*I)*b*c*(1 - c^2*x^2)^(3/2)*Ell
ipticF[I*ArcSinh[Sqrt[-c^2]*x], 1]))/(6*c^4*Sqrt[-c^2]*d^3*(-1 + c^2*x^2)^2
)
```

Maple [C] Result contains complex when optimal does not.
time = 0.25, size = 308, normalized size = 2.05

method	result
default	$a\left(\frac{x^{2}}{c^{2} d \left(-c^{2} d \,x^{2}+d \right)^{\frac{3}{2}}}-\frac{2}{3 d \,c^{4} \left(-c^{2} d \,x^{2}+d \right)^{\frac{3}{2}}}\right)+\frac{b \sqrt{-d \left(c^{2} x^{2}-1\right)}\, \arcsin \left(c x \right) x^{2}}{d^{3} \left(c^{2} x^{2}-1\right)^{2} c^{2}}-\frac{b \sqrt{-d \left(c^{2} x^{2}-1\right)}\, \sqrt{-c^{2}x^{2}}}{6 d^{3} \left(c^{2} x^{2}-1\right)^{2} c^{3}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/3/d/c^4/(-c^2*d*x^2+d)^(3/2))+b*(-d*(c^
2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^2*arcsin(c*x)*x^2-1/6*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(c^2*x^2-1)^2/c^3*(-c^2*x^2+1)^(1/2)*x-2/3*b*(-d*(c^2*x^2-1))^(
1/2)/d^3/(c^2*x^2-1)^2/c^4*arcsin(c*x)+5/6*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)/c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)-5/6*b*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+
1)^(1/2)+I)
```

Maxima [A]
time = 0.49, size = 160, normalized size = 1.07

$$\frac{1}{12}\,bc\left(\frac{2\,x}{c^{6}d^{\frac{5}{2}}x^{2}-c^{4}d^{\frac{5}{2}}}+\frac{5\,\log\left(cx+1\right)}{c^{5}d^{\frac{5}{2}}}-\frac{5\,\log\left(cx-1\right)}{c^{5}d^{\frac{5}{2}}}\right)+\frac{1}{3}\,b\left(\frac{3\,x^{2}}{\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}c^{2}d}-\frac{2}{\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}c^{4}d}\right)\arcsin\left(cx\right)+\frac{1}{3}\,a\left(\frac{3\,x^{2}}{\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}c^{2}d}-\frac{2}{\left(-c^{2}dx^{2}+d\right)^{\frac{3}{2}}c^{4}d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/12*b*c*(2*x/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) + 5*log(c*x + 1)/(c^5*d^(5/2)
) - 5*log(c*x - 1)/(c^5*d^(5/2))) + 1/3*b*(3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^
2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))*arcsin(c*x) + 1/3*a*(3*x^2/((-c^2*
d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))
```

Fricas [A]
time = 3.52, size = 421, normalized size = 2.81

$$\left[-\frac{4\,\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,bcx-5\,\left(bc^{4}x^{4}-2\,bc^{2}x^{2}+b\right)\sqrt{d}\,\log\left(-\frac{c^{6}dx^{6}+5\,c^{4}dx^{4}-5\,c^{2}dx^{2}-4\,\left(c^{3}x^{3}+cx\right)\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,\sqrt{d}-d}{c^{6}x^{6}-3\,c^{4}x^{4}+3\,c^{2}x^{2}-1}\right)-8\,\left(3\,ac^{2}x^{2}+\left(3\,bc^{2}x^{2}-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{-c^{2}dx^{2}+d}}{24\,\left(c^{8}d^{3}x^{4}-2\,c^{6}d^{3}x^{2}+c^{4}d^{3}\right)},\ -\frac{2\,\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,bcx-5\,\left(bc^{4}x^{4}-2\,bc^{2}x^{2}+b\right)\sqrt{-d}\,\arctan\left(\frac{2\,\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}\,c\sqrt{-d}\,x}{c^{4}dx^{4}-d}\right)-4\,\left(3\,ac^{2}x^{2}+\left(3\,bc^{2}x^{2}-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{-c^{2}dx^{2}+d}}{12\,\left(c^{8}d^{3}x^{4}-2\,c^{6}d^{3}x^{2}+c^{4}d^{3}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/24*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - 5*(b*c^4*x^4 - 2*
b*c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 - 4*(c^3
*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 -
 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 8*(3*a*c^2*x^2 + (3*b*c^2*x^2 - 2*b)*arcsin(
c*x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3),
-1/12*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - 5*(b*c^4*x^4 - 2*b
*c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*s
qrt(-d)*x/(c^4*d*x^4 - d)) - 4*(3*a*c^2*x^2 + (3*b*c^2*x^2 - 2*b)*arcsin(c*
x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)]
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.133 $\int \frac{x^2(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=125

$$-\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\text{ArcSin}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)-1/6*b/c^3/d^2/(-c^2*x^2+1)
^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/6*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^3/d^2
/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4771, 272, 45}

$$\frac{x^3(a+b\text{ArcSin}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin
[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]
)/(6*c^3*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
```

```
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^3(a+b\sin^{-1}(cx))}{3d(d-c^2dx^2)^{3/2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x^3}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$
$$= \frac{x^3(a+b\sin^{-1}(cx))}{3d(d-c^2dx^2)^{3/2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{x}{(1-c^2x)^2}\,dx,x,x^2\right)}{6d^2\sqrt{d-c^2dx^2}}$$
$$= \frac{x^3(a+b\sin^{-1}(cx))}{3d(d-c^2dx^2)^{3/2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(\frac{1}{c^2(-1+c^2x)^2}+\frac{1}{c^2(-1+c^2x)}\right)\,dx,x,\right.}{6d^2\sqrt{d-c^2dx^2}}$$
$$= -\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))}{3d(d-c^2dx^2)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\log(1-c^2}{6c^3d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 0.12, size = 103, normalized size = 0.82

$$\frac{\sqrt{d-c^2dx^2}\left(2ac^3x^3-b\sqrt{1-c^2x^2}+2bc^3x^3\text{ArcSin}(cx)-b(1-c^2x^2)^{3/2}\log\left(-1+c^2x^2\right)\right)}{6c^3d^3\left(-1+c^2x^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(2*a*c^3*x^3 - b*Sqrt[1 - c^2*x^2] + 2*b*c^3*x^3*ArcSi
n[c*x] - b*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2]))/(6*c^3*d^3*(-1 + c^2*x^2
)^2)
```

Maple [C] Result contains complex when optimal does not.
time = 0.20, size = 1242, normalized size = 9.94

method	result
default	$a\left(\frac{x}{2c^2d(-c^2dx^2+d)^{\frac{3}{2}}}-\frac{\frac{x}{3d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{2x}{3d^2\sqrt{-c^2dx^2+d}}}{2c^2}\right)+\frac{ib\sqrt{-d(c^2x^2-1)}\,(-c^2x^2+1)x^3}{6d^3(3c^8x^8-9c^6x^6+10c^4x^4-5c^2x^2+1)}-\frac{ib\sqrt{-d}}{6d^3(3c^8}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/2*x/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/2/c^2*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2
/3/d^2*x/(-c^2*d*x^2+d)^(1/2)))+1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x
^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3-1/6*I*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*(-c^2*x^2+1)
*x^5+b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2
+1)*c^4*arcsin(c*x)*x^7+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6
+10*c^4*x^4-5*c^2*x^2+1)*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^6+1/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*x^
5-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*
x^2+1)*x^3-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4
-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4-b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*
x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)*x^5-1/3*I*b*(-d*(c^2*
x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^
3/d^3/(c^2*x^2-1)*arcsin(c*x)-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9
*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4+1/2*b
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*
(-c^2*x^2+1)^(1/2)*x^2+1/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^
6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)*x^3-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7+4/3*I*b*(-d*(c^2*x^2
-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*(-c^2*x^2+1)^
(1/2)*arcsin(c*x)*x^2-1/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6
+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2)+1/3*b*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)/c^3/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [**A**]
time = 0.49, size = 153, normalized size = 1.22

$$\frac{1}{6}\,bc\left(\frac{1}{c^6d^{\frac{5}{2}}x^2 - c^4d^{\frac{5}{2}}} - \frac{\log\left(cx+1\right)}{c^4d^{\frac{5}{2}}} - \frac{\log\left(cx-1\right)}{c^4d^{\frac{5}{2}}}\right) - \frac{1}{3}\,b\left(\frac{x}{\sqrt{-c^2dx^2+d}\,c^2d^2} - \frac{x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^2d}\right)\arcsin\left(cx\right) - \frac{1}{3}\,a\left(\frac{x}{\sqrt{-c^2dx^2+d}\,c^2d^2} - \frac{x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}c^2d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*b*c*(1/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) - log(c*x + 1)/(c^4*d^(5/2)) - l
og(c*x - 1)/(c^4*d^(5/2))) - 1/3*b*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((
-c^2*d*x^2 + d)^(3/2)*c^2*d))*arcsin(c*x) - 1/3*a*(x/(sqrt(-c^2*d*x^2 + d)*
c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d))
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a+b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral(x**2*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^2/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.134 $\int \frac{x(a+b\text{ArcSin}(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=119

$$-\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{a+b\text{ArcSin}(cx)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/6*b*x/c/d^2/(-c^2*x^2+1)
^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/6*b*arctanh(c*x)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(
-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {4767, 205, 212}

$$\frac{a+b\text{ArcSin}(cx)}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*x)/(c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*
x])/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6
*c^2*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{a+b\sin^{-1}(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{1}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$
$$= -\frac{bx}{6cd^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,d}{6cd^2\sqrt{d-c^2dx^2}}$$
$$= -\frac{bx}{6cd^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\,\tanh^{-1}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 0.03, size = 85, normalized size = 0.71

$$\frac{-2a+bcx\sqrt{1-c^2x^2}-2b\text{ArcSin}(cx)+b(1-c^2x^2)^{3/2}\tanh^{-1}(cx)}{6c^2d^2\,(-1+c^2x^2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-2*a + b*c*x*Sqrt[1 - c^2*x^2] - 2*b*ArcSin[c*x] + b*(1 - c^2*x^2)^(3/2)*A
rcTanh[c*x])/(6*c^2*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.13, size = 259, normalized size = 2.18

method	result
default	$\frac{a}{3c^2d(-c^2dx^2+d)^{\frac{3}{2}}} - \frac{b\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,x}{6d^3(c^4x^4-2c^2x^2+1)c} + \frac{b\sqrt{-d\,(c^2x^2-1)}\,\arcsin(cx)}{3d^3(c^4x^4-2c^2x^2+1)c^2} - \frac{b\sqrt{-d\,(c^2x^2-}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-
2*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x+1/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x
^4-2*c^2*x^2+1)/c^2*arcsin(c*x)-1/6*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+1/6*b*(-d*(c^2*x^2-
```

1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2
)+I)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] b*integrate(x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*
c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 1/3*a/((-c^2
*d*x^2 + d)^(3/2)*c^2*d)
```

Fricas [A]
time = 3.33, size = 374, normalized size = 3.14

$$\left[-\frac{4\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,bcx-(bc^4x^4-2bc^2x^2+b)\sqrt{d}\,\log\left(-\frac{c^6dx^6+5c^4dx^4-5c^2dx^2+4(c^3x^3+cx)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,\sqrt{d}-d}{c^6x^6-3c^4x^4+3c^2x^2-1}\right)-8\sqrt{-c^2dx^2+d}\,(b\arcsin(cx)+a)}{24\,(c^6d^3x^4-2c^4d^3x^2+c^2d^3)},\ -\frac{2\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,bcx+(bc^4x^4-2bc^2x^2+b)\sqrt{-d}\,\arctan\left(\frac{2\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}\,c\sqrt{-d}\,x}{c^4dx^4-d}\right)-4\sqrt{-c^2dx^2+d}\,(b\arcsin(cx)+a)}{12\,(c^6d^3x^4-2c^4d^3x^2+c^2d^3)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/24*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - (b*c^4*x^4 - 2*b*
c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 + 4*(c^3*x
^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 - 3
*c^4*x^4 + 3*c^2*x^2 - 1)) - 8*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c
^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3), -1/12*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-
c^2*x^2 + 1)*b*c*x + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-
c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) - 4*sqrt(-c
^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a+b\,\mathrm{asin}\,(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{{(d-c^2\,d\,x^2)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.135 $\int \frac{a+b\text{ArcSin}(cx)}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=154

$$-\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x(a+b\text{ArcSin}(cx))}{3d(d-c^2dx^2)^{3/2}}+\frac{2x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+2/3*x*(a+b*arcsin(c*x))/d^2/
(-c^2*d*x^2+d)^(1/2)-1/6*b/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/
3*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4747, 4745, 266, 267}

$$\frac{2x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{x(a+b\text{ArcSin}(cx))}{3d(d-c^2dx^2)^{3/2}}-\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x
]))/(3*d*(d - c^2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d -
 c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c*d^2*Sqrt[d - c^2
*d*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x(a+b\sin^{-1}(cx))}{3d\,(d-c^2dx^2)^{3/2}} + \frac{2\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^{3/2}}\,dx}{3d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6cd^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d\,(d-c^2dx^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(2bc\sqrt{\right.}{}$$

$$= -\frac{b}{6cd^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d\,(d-c^2dx^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-}}{3d}$$

Mathematica [A]
time = 0.13, size = 113, normalized size = 0.73

$$-\frac{\sqrt{d-c^2dx^2}\left(-6acx+4ac^3x^3+b\sqrt{1-c^2x^2}+2bcx(-3+2c^2x^2)\operatorname{ArcSin}(cx)-2b(1-c^2x^2)^{3/2}\log\left(-1+c^2x^2\right)\right)}{6cd^3\left(-1+c^2x^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2
*b*c*x*(-3 + 2*c^2*x^2)*ArcSin[c*x] - 2*b*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*
x^2]))/(c*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] Result contains complex when optimal does not.
time = 0.13, size = 1072, normalized size = 6.96

method	result
default	$a\left(\frac{x}{3d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{2x}{3d^2\sqrt{-c^2dx^2+d}}\right)+\frac{2ib\sqrt{-d\left(c^2x^2-1\right)}\,c^6x^7}{3d^3(3c^6x^6-10c^4x^4+11c^2x^2-4)}+\frac{8ib\sqrt{-d\left(c^2x^2-1\right)}\,c^2x^3}{3d^3(3c^6x^6-10c^4x^4+11c^2x^2-4)}-\frac{ib}{d^3(}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))+2/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7+8/3*I*b
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3-I*b
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x-2*I*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*arcsin(c*x)
*(-c^2*x^2+1)^(1/2)*x^4+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c
/d^3/(c^2*x^2-1)*arcsin(c*x)-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c
^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^5-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/2*b
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2
+1)^(1/2)*x^2+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x
^2-4)*(-c^2*x^2+1)*x+14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*
x^4+11*c^2*x^2-4)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+17/3*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3-7/3*I
*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5+2
/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2
*x^2+1)^(1/2)-5/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c
^2*x^2-4)*c^2*(-c^2*x^2+1)*x^3+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^
6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^5-4*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x-2/3*b*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)
```

Maxima [A]
time = 0.50, size = 141, normalized size = 0.92

$$\frac{1}{6}\,bc\left(\frac{1}{c^4d^{\frac{5}{2}}x^2-c^2d^{\frac{5}{2}}}+\frac{2\,\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}}+\frac{2\,\log\left(cx-1\right)}{c^2d^{\frac{5}{2}}}\right)+\frac{1}{3}\,b\left(\frac{2\,x}{\sqrt{-c^2dx^2+d}\,d^2}+\frac{x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}d}\right)\arcsin\left(cx\right)+\frac{1}{3}\,a\left(\frac{2\,x}{\sqrt{-c^2dx^2+d}\,d^2}+\frac{x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*b*c*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2)) +
 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + x/
((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*(2*x/(sqrt(-c^2*d*x^2 + d)*
d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^6 - 3*c^4*d^3
*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{\left(-d \left(cx - 1\right) \left(cx + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(5/2), x)
```

3.136 $\int \frac{a+b\text{ArcSin}(cx)}{x(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=291

$$-\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{a+b\text{ArcSin}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{a+b\text{ArcSin}(cx)}{d^2\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\left(a+b\text{ArcSin}(cx)\right)\tanh^{-1}}{d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+(a+b*arcsin(c*x))/d^2/(-c^2*d*
x^2+d)^(1/2)-1/6*b*c*x/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*(a+b*a
rcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*
d*x^2+d)^(1/2)-7/6*b*arctanh(c*x)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/
2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*
x^2+d)^(1/2)-I*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2
/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.28, antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4793, 4803, 4268, 2317, 2438, 212, 205}

$$\frac{a+b\text{ArcSin}(cx)}{d^2\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)\left(a+b\text{ArcSin}(cx)\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{a+b\text{ArcSin}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{7b\sqrt{1-c^2x^2}\tanh^{-1}(cx)}{6d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(b*c*x)/(d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*
x])/(3*d*(d - c^2*d*x^2)^(3/2)) + (a + b*ArcSin[c*x])/(d^2*Sqrt[d - c^2*d*x
^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) - (7*b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sq
rt[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[
c*x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\int \frac{a+b\sin^{-1}(cx)}{x(d-c^2dx^2)^{3/2}}\,dx}{d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{a+b\sin^{-}}{x\sqrt{d-c}}}{d^2}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2}}{6d^2\sqrt{}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2}}{6d^2\sqrt{}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x}}{}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x}}{}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\sin^{-1}(cx)}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{a+b\sin^{-1}(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x}}{}$$

Mathematica [A]
time = 1.16, size = 456, normalized size = 1.57

$$-\frac{a(-4+3c^2x^2)\sqrt{d-c^2dx^2}}{3d^3(-1+c^2x^2)^2} + \frac{a\log(x)}{d^{5/2}} - \frac{a\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)}{d^{5/2}} + \frac{b\left(20\mathrm{ArcSin}(cx)+12\mathrm{ArcSin}(cx)\cos(2\mathrm{ArcSin}(cx))+18\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)+6\mathrm{ArcSin}(cx)\cos(3\mathrm{ArcSin}(cx))\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)-18\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)-6\mathrm{ArcSin}(cx)\cos(3\mathrm{ArcSin}(cx))\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)+21\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)+7\cos(3\mathrm{ArcSin}(cx))\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)-21\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)-7\cos(3\mathrm{ArcSin}(cx))\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)+24i(1-c^2x^2)^{3/2}\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)-24i(1-c^2x^2)^{3/2}\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)-2\sin(2\mathrm{ArcSin}(cx))\right)}{24d(d-c^2dx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/3*(a*(-4 + 3*c^2*x^2)*Sqrt[d - c^2*d*x^2])/(d^3*(-1 + c^2*x^2)^2) + (a*L
og[x])/d^(5/2) - (a*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/d^(5/2) + (b*(20*
ArcSin[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 18*Sqrt[1 - c^2*x^2]*ArcS
in[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1
 - E^(I*ArcSin[c*x])] - 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*ArcSi
n[c*x])] - 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*ArcSin[c*x])] + 21
*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 7*Cos[3*A
rcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 21*Sqrt[1 - c^2*
x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 7*Cos[3*ArcSin[c*x]]*Lo
g[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + (24*I)*(1 - c^2*x^2)^(3/2)*Pol
yLog[2, -E^(I*ArcSin[c*x])] - (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, E^(I*Ar
cSin[c*x])] - 2*Sin[2*ArcSin[c*x]]))/(24*d*(d - c^2*d*x^2)^(3/2))
```

Maple [A]
time = 0.16, size = 449, normalized size = 1.54

method	result
default	$\frac{a}{3d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{a}{d^2\sqrt{-c^2dx^2+d}}-\frac{a\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right)}{d^{\frac{5}{2}}}-\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)x^2c^2}{d^3(c^2x^2-1)^2}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)

[Out] 1/3*a/d/(-c^2*d*x^2+d)^(3/2)+a/d^2/(-c^2*d*x^2+d)^(1/2)-a/d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)*x^2*c^2-1/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)*x*c+4/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)+b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-7/3*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")

[Out] -1/3*a*(3*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(5/2) - 3/(sqrt(-c^2*d*x^2 + d)*d^2) - 1/((-c^2*d*x^2 + d)^(3/2)*d)) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(5/2)), x)
```

3.137 $\int \frac{a+b\text{ArcSin}(cx)}{x^2(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=224

$$-\frac{bc\sqrt{d-c^2dx^2}}{6d^3(1-c^2x^2)^{3/2}}-\frac{a+b\text{ArcSin}(cx)}{dx(d-c^2dx^2)^{3/2}}+\frac{4c^2x(a+b\text{ArcSin}(cx))}{3d(d-c^2dx^2)^{3/2}}+\frac{8c^2x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{d-c^2dx^2}\log}{d^3\sqrt{1-c^2x^2}}$$

```
[Out] (-a-b*arcsin(c*x))/d/x/(-c^2*d*x^2+d)^(3/2)+4/3*c^2*x*(a+b*arcsin(c*x))/d/(
-c^2*d*x^2+d)^(3/2)+8/3*c^2*x*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)-1/
6*b*c*(-c^2*d*x^2+d)^(1/2)/d^3/(-c^2*x^2+1)^(3/2)+b*c*ln(x)*(-c^2*d*x^2+d)^
(1/2)/d^3/(-c^2*x^2+1)^(1/2)+5/6*b*c*ln(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/d^
3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {277, 198, 197, 4779, 12, 1265, 907}

$$\frac{8c^2x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{4c^2x(a+b\text{ArcSin}(cx))}{3d(d-c^2dx^2)^{3/2}}-\frac{a+b\text{ArcSin}(cx)}{dx(d-c^2dx^2)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3(1-c^2x^2)^{3/2}}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{d^3\sqrt{1-c^2x^2}}+\frac{5bc\sqrt{d-c^2dx^2}\log(1-c^2x^2)}{6d^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[d - c^2*d*x^2])/(d^3*(1 - c^2*x^2)^(3/2)) - (a + b*ArcSin[c*
x])/(d*x*(d - c^2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x]))/(3*d*(d - c
^2*d*x^2)^(3/2)) + (8*c^2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]
) + (b*c*Sqrt[d - c^2*d*x^2]*Log[x])/(d^3*Sqrt[1 - c^2*x^2]) + (5*b*c*Sqrt[
d - c^2*d*x^2]*Log[1 - c^2*x^2])/(6*d^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
```

```
0] && NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}} + \left(4c^2\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x(1-c^2x^2)^2}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(8c^2\right)\int \frac{a+b\sin^{-1}(cx)}{(d-c^2dx^2)^{3/2}}\,dx}{3d} + \frac{\left(bc\sqrt{1-c\right.}{}$$

$$= -\frac{2bc}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{8c^2x}{3d}$$

$$= -\frac{bc}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{8c^2x}{3d}$$

Mathematica [A]
time = 0.19, size = 188, normalized size = 0.84

$$-\frac{\sqrt{d-c^2dx^2}\left(6a-24ac^2x^2+16ac^4x^4+bcx\sqrt{1-c^2x^2}+2b(3-12c^2x^2+8c^4x^4)\,\mathrm{ArcSin}(cx)-3bcx(1-c^2x^2)^{3/2}\log\left(x^2\right)-5bcx\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)+5bc^3x^3\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)\right)}{6d^3x\left(-1+c^2x^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(6*a - 24*a*c^2*x^2 + 16*a*c^4*x^4 + b*c*x*Sqrt[1
 - c^2*x^2] + 2*b*(3 - 12*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x] - 3*b*c*x*(1 - c
^2*x^2)^(3/2)*Log[x^2] - 5*b*c*x*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] + 5*b*c
^3*x^3*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]))/(d^3*x*(-1 + c^2*x^2)^2)
```

Maple [C] Result contains complex when optimal does not.
time = 0.25, size = 1346, normalized size = 6.01

method	result
default	$a\left(-\frac{1}{dx(-c^2d\,x^2+d)^{\frac{3}{2}}}+4c^2\left(\frac{x}{3d(-c^2d\,x^2+d)^{\frac{3}{2}}}+\frac{2x}{3d^2\sqrt{-c^2d\,x^2+d}}\right)\right)+\frac{20ib\sqrt{-d\left(c^2x^2-1\right)}\,x^3(-c^2x^2+1)c}{(8c^6x^6-25c^4x^4+26c^2x^2-9)d^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/d/x/(-c^2*d*x^2+d)^(3/2)+4*c^2*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*
x/(-c^2*d*x^2+d)^(1/2)))+20*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^
4+26*c^2*x^2-9)/d^3*x^3*(-c^2*x^2+1)*c^4+136/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(
8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c
^3+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*
```

```
x^7*(-c^2*x^2+1)*c^8+4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*
c^2*x^2-9)/d^3*x*c^2-4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*
c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2+140/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x
^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*c^6-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*
c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^4*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5
-24*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c+3/2*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4
*x^4+26*c^2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*c+9*b*(-d*(c^2*x^2-1))^(1/2)/(8*c
^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3/x*arcsin(c*x)-4/3*b*(-d*(c^2*x^2-1))^(1
/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2)*c^3+56*b
*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(
c*x)*c^4-44*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3*x*arcsin(c*x)*c^2-5/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^
2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c-b*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c-64/3*b*
(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c
*x)*c^6-24*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d
^3*x^3*c^4-112/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^
2-9)/d^3*x^7*c^8+16/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^
2*x^2-1)*arcsin(c*x)*c-80/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^
4+26*c^2*x^2-9)/d^3*x^5*(-c^2*x^2+1)*c^6+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8
*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^9*c^10
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(8*c^2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 4*c^2*x/((-c^2*d*x^2 + d)^(3/2)
*d) - 3/((-c^2*d*x^2 + d)^(3/2)*d*x)) + b*integrate(arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))/((c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2)*sqrt(c*x + 1)*
sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^8 - 3*c^4*d^3
*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\operatorname{asin}{\left(cx \right)}}{x^{2} \left(- d \left(cx - 1\right) \left(cx + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{x^2\,{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(5/2)), x)
```

3.138 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=433

$$\frac{bc}{4d^2x\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2(a+b\text{ArcSin}(cx))}{6d\,(d-c^2dx^2)^{3/2}}-$$

```
[Out] 5/6*c^2*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+1/2*(-a-b*arcsin(c*x))/d/x
^2/(-c^2*d*x^2+d)^(3/2)+5/2*c^2*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)+
1/4*b*c/d^2/x/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-5/12*b*c^3*x/d^2/(-c^
2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-3/4*b*c*(-c^2*x^2+1)^(1/2)/d^2/x/(-c^2*
d*x^2+d)^(1/2)-5*c^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-
c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-13/6*b*c^2*arctanh(c*x)*(-c^2*x^2
+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)+5/2*I*b*c^2*polylog(2,-I*c*x-(-c^2*x^2+1
)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*I*b*c^2*polylog(2,
I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.37, antiderivative size = 433, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.370$, Rules used = {4789, 4793, 4803, 4268, 2317, 2438, 212, 205, 296, 331}

$$\frac{5c^2(a+b\text{ArcSin}(cx))}{2d^2\sqrt{d-c^2dx^2}}-\frac{5c^2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2\sqrt{d-c^2dx^2}}+\frac{5c^2(a+b\text{ArcSin}(cx))}{6d\,(d-c^2dx^2)^{3/2}}-\frac{a+b\text{ArcSin}(cx)}{2dx^2\,(d-c^2dx^2)^{3/2}}+\frac{5ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}-\frac{5ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{bc}{4d^2x\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}-\frac{13bc^2\sqrt{1-c^2x^2}\,\tanh^{-1}(cx)}{6d^2\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (b*c)/(4*d^2*x*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (5*b*c^3*x)/(12*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (3*b*c*Sqrt[1 - c^2*x^2])/(4*d^2*
x*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x]))/(6*d*(d - c^2*d*x^2)^(
3/2)) - (a + b*ArcSin[c*x])/(2*d*x^2*(d - c^2*d*x^2)^(3/2)) + (5*c^2*(a + b
*ArcSin[c*x]))/(2*d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (13*
b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)
/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c
^2*d*x^2]) - (((5*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x]
)])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
```

```
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 296

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-(
c*x)^(m + 1))*((a + b*x^n)^(p + 1)/(a*c*n*(p + 1))), x] + Dist[(m + n*(p +
1) + 1)/(a*n*(p + 1)), Int[(c*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a,
 b, c, m}, x] && IGtQ[n, 0] && LtQ[p, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
```

```
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{1}{2}\left(5c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^2(1-c^2}}{2d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\sin^{-1}(cx))}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{a+b\sin^{-1}(cx)}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{(5c^2}{}$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 7.10, size = 537, normalized size = 1.24

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-1/2*a/(d^3*x^2) + (a*c^2)/(3*d^3*(-1 + c^2*x^2)
^2) - (2*a*c^2)/(d^3*(-1 + c^2*x^2))) + (5*a*c^2*Log[x])/(2*d^(5/2)) - (5*a
*c^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/(2*d^(5/2)) + (b*c^2*Sqrt[
1 - c^2*x^2]*((-2*(-1 + ArcSin[c*x]))/(-1 + c*x) + 52*ArcSin[c*x] - 6*Cot[A
rcSin[c*x]/2] - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 60*ArcSin[c*x]*(Log[1
- E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + 52*Log[Cos[ArcSin[c*x]
/2] - Sin[ArcSin[c*x]/2]] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]
 + (60*I)*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])])
+ 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + (4*ArcSin[c*x]*Sin[ArcSin[c*x]/2])/(
```

```
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (52*ArcSin[c*x]*Sin[ArcSin[c*x
]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x]*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*(1 + ArcSin[c*x]
))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (52*ArcSin[c*x]*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*Tan[ArcSin[c*x]/2])
)/(24*d^2*Sqrt[d*(1 - c^2*x^2)])
```

Maple [A]
time = 0.28, size = 624, normalized size = 1.44

method	result
default	$-\frac{a}{2d\,x^{2}\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{5a\,c^{2}}{6d\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{5a\,c^{2}}{2d^{2}\sqrt{-c^{2}d\,x^{2}+d}}-\frac{5a\,c^{2}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^{2}d\,x^{2}+d}}{x}\right)}{2d^{\frac{5}{2}}}-\frac{5b\sqrt{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2/(-c^2*d*x^2+d)^(3/2)+5/6*a*c^2/d/(-c^2*d*x^2+d)^(3/2)+5/2*a*c^
2/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*a*c^2/d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+
d)^(1/2))/x)-5/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*arc
sin(c*x)*c^4+1/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x*(-c^2
*x^2+1)^(1/2)*c^3+10/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*a
rcsin(c*x)*c^2-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x*(-c
^2*x^2+1)^(1/2)*c-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x^
2*arcsin(c*x)+5/2*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-
1)*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-13/3*I*b*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*arctan(I*c*x+(-c^2*x^2+1)^(1/
2))-5/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c^2*d
ilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-5/2*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(c^2*x^2-1)*c^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/6*a*(15*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(5
/2) - 15*c^2/(sqrt(-c^2*d*x^2 + d)*d^2) - 5*c^2/((-c^2*d*x^2 + d)^(3/2)*d)
+ 3/((-c^2*d*x^2 + d)^(3/2)*d*x^2)) + b*integrate(arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))/((c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3)*sqrt(c*x + 1)*sq
rt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^9 - 3*c^4*d^3
*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x^3 \left(-d (cx - 1) (cx + 1)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))/(x**3*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x^3 \left(d - c^2\,d\,x^2\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(5/2)), x)
```

3.139 $\int \frac{a+b\text{ArcSin}(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=310

$$-\frac{bc^3\sqrt{d-c^2dx^2}}{6d^3(1-c^2x^2)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3x^2\sqrt{1-c^2x^2}}-\frac{a+b\text{ArcSin}(cx)}{3dx^3(d-c^2dx^2)^{3/2}}-\frac{2c^2(a+b\text{ArcSin}(cx))}{dx(d-c^2dx^2)^{3/2}}+\frac{8c^4x(a+b\text{ArcSin}(cx)}{3d(d-c^2dx^2)^{3/2}}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3/(-c^2*d*x^2+d)^(3/2)-2*c^2*(a+b*arcsin(c*x))/d
/x/(-c^2*d*x^2+d)^(3/2)+8/3*c^4*x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+
16/3*c^4*x*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b*c^3*(-c^2*d*x^2
+d)^(1/2)/d^3/(-c^2*x^2+1)^(3/2)-1/6*b*c*(-c^2*d*x^2+d)^(1/2)/d^3/x^2/(-c^2
*x^2+1)^(1/2)+8/3*b*c^3*ln(x)*(-c^2*d*x^2+d)^(1/2)/d^3/(-c^2*x^2+1)^(1/2)+4
/3*b*c^3*ln(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {277, 198, 197, 4779, 12, 1813, 1634}

$$-\frac{2c^2(a+b\text{ArcSin}(cx))}{dx(d-c^2dx^2)^{3/2}}-\frac{a+b\text{ArcSin}(cx)}{3dx^3(d-c^2dx^2)^{3/2}}+\frac{16c^4x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\text{ArcSin}(cx))}{3d(d-c^2dx^2)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3x^2\sqrt{1-c^2x^2}}-\frac{bc^3\sqrt{d-c^2dx^2}}{6d^3(1-c^2x^2)^{3/2}}+\frac{8bc^3\log(x)\sqrt{d-c^2dx^2}}{3d^3\sqrt{1-c^2x^2}}+\frac{4bc^3\sqrt{d-c^2dx^2}\log(1-c^2x^2)}{3d^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(b*c^3*Sqrt[d - c^2*d*x^2])/(d^3*(1 - c^2*x^2)^(3/2)) - (b*c*Sqrt[d -
c^2*d*x^2])/(6*d^3*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(3*d*x^3*(d
 - c^2*d*x^2)^(3/2)) - (2*c^2*(a + b*ArcSin[c*x]))/(d*x*(d - c^2*d*x^2)^(3/
2)) + (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x
*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) + (8*b*c^3*Sqrt[d - c^2*d
*x^2]*Log[x])/(3*d^3*Sqrt[1 - c^2*x^2]) + (4*b*c^3*Sqrt[d - c^2*d*x^2]*Log[
1 - c^2*x^2])/(3*d^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
```

```
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} + \left(2c^2\right)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^3(1-c}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2(a+b\sin^{-1}(cx))}{dx\left(d-c^2dx^2\right)^{3/2}} + \left(8c^4\right)\int \frac{a+b\sin^{-1}(cx)}{\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{(bc}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2(a+b\sin^{-1}(cx))}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{8c^4x(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{\left(16c^4\right)\int}{}$$

$$= -\frac{7bc^3}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}}{6d^2x^2\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2(}{dx}$$

$$= -\frac{bc^3}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}}{6d^2x^2\sqrt{d-c^2dx^2}} - \frac{a+b\sin^{-1}(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2(}{dx}$$

Mathematica [A]
time = 0.21, size = 213, normalized size = 0.69

$$-\frac{\sqrt{d-c^2dx^2}\left(2a+12ac^2x^2-48ac^4x^4+32ac^6x^6+bcx\sqrt{1-c^2x^2}+2b(1+6c^2x^2-24c^4x^4+16c^6x^6)\,\mathrm{ArcSin}(cx)-8bc^3x^3(1-c^2x^2)^{3/2}\log\left(x^2\right)-8bc^3x^3\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)+8bc^5x^5\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)\right)}{6d^3x^3\left(-1+c^2x^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(2*a + 12*a*c^2*x^2 - 48*a*c^4*x^4 + 32*a*c^6*x^6
 + b*c*x*Sqrt[1 - c^2*x^2] + 2*b*(1 + 6*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x^6)*
ArcSin[c*x] - 8*b*c^3*x^3*(1 - c^2*x^2)^(3/2)*Log[x^2] - 8*b*c^3*x^3*Sqrt[1
 - c^2*x^2]*Log[1 - c^2*x^2] + 8*b*c^5*x^5*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^
2]))/(d^3*x^3*(-1 + c^2*x^2)^2)
```

Maple [C] Result contains complex when optimal does not.
time = 0.39, size = 1877, normalized size = 6.05

method	result	size
default	Expression too large to display	1877

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 560/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x
^2-1)/d^3*x^7*c^10+128/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+
35*c^4*x^4-10*c^2*x^2-1)/d^3*x^11*c^14-344/3*b*(-d*(c^2*x^2-1))^(1/2)/(12*c
```

```
^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^3*arcsin(c*x)*c^6-2*b*(-d*
(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^2*
(-c^2*x^2+1)^(1/2)*c^5+12*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+3
5*c^4*x^4-10*c^2*x^2-1)/d^3*x*arcsin(c*x)*c^4+6*b*(-d*(c^2*x^2-1))^(1/2)/(1
2*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3/x*arcsin(c*x)*c^2-176/3*I
*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d
^3*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5-64*I*b*(-d*(c^2*x^2-1))^(1/2)/(12
*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^6*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)*c^9+128*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x
^4-10*c^2*x^2-1)/d^3*x^4*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7+2*b*(-d*(c^2*x^
2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*(-c^2*x^2+1
)^(1/2)*c^3+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-
10*c^2*x^2-1)/d^3/x^3*arcsin(c*x)+1/6*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-
36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3/x^2*(-c^2*x^2+1)^(1/2)*c+160*b*(-d*
(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^5*
arcsin(c*x)*c^8-8/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^
2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^4-1)*c^3-64*b*(-d*(c^2*x^2-1))^(1/2)/(12
*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^7*arcsin(c*x)*c^10-448/3
*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)
/d^3*x^9*c^12-280/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^
4*x^4-10*c^2*x^2-1)/d^3*x^5*c^8+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8
-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^3*c^6+8/3*I*b*(-d*(c^2*x^2-1))^(
1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x*c^4-16/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*c^3+a*(-1/3/d/x^3/(-c^2*d*x^2+d)^(3/2)+
2*c^2*(-1/d/x/(-c^2*d*x^2+d)^(3/2)+4*c^2*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3/
d^2*x/(-c^2*d*x^2+d)^(1/2))))+128/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-
36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^9*(-c^2*x^2+1)*c^12-320/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^7
*(-c^2*x^2+1)*c^10+80*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*
c^4*x^4-10*c^2*x^2-1)/d^3*x^5*(-c^2*x^2+1)*c^8-40/3*I*b*(-d*(c^2*x^2-1))^(1
/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^3*(-c^2*x^2+1)*c^
6-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x
^2-1)/d^3*x*(-c^2*x^2+1)*c^4
```

Maxima [A]

time = 0.52, size = 255, normalized size = 0.82

$$\frac{1}{6}\,bc\left(\frac{8\,c^2\log\left(cx+1\right)}{d^{\frac{5}{2}}}+\frac{8\,c^2\log\left(cx-1\right)}{d^{\frac{5}{2}}}+\frac{16\,c^2\log\left(x\right)}{d^{\frac{5}{2}}}+\frac{1}{c^2d^{\frac{5}{2}}x^4-d^{\frac{5}{2}}x^2}\right)+\frac{1}{3}\left(\frac{16\,c^4x}{\sqrt{-c^2dx^2+d}\,d^2}+\frac{8\,c^4x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}d}-\frac{6\,c^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}dx}-\frac{1}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}dx^3}\right)b\arcsin\left(cx\right)+\frac{1}{3}\left(\frac{16\,c^4x}{\sqrt{-c^2dx^2+d}\,d^2}+\frac{8\,c^4x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}d}-\frac{6\,c^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}dx}-\frac{1}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}dx^3}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*b*c*(8*c^2*log(c*x + 1)/d^(5/2) + 8*c^2*log(c*x - 1)/d^(5/2) + 16*c^2*l
og(x)/d^(5/2) + 1/(c^2*d^(5/2)*x^4 - d^(5/2)*x^2)) + 1/3*(16*c^4*x/(sqrt(-c
```

```
^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d) - 6*c^2/((-c^2*d*x^
2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*b*arcsin(c*x) + 1/3*(
16*c^4*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d) -
6*c^2/((-c^2*d*x^2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^10 - 3*c^4*d^
3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{x^{4} \left(- d \left(cx - 1\right) \left(cx + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**4*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^4), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{x^4\,{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(5/2)), x)
```

3.140 $\int \frac{\mathbf{ArcSin}(ax)}{(c-a^2cx^2)^{7/2}}\,dx$

Optimal. Leaf size=210

$$-\frac{1}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}}-\frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)}{5c(c-a^2cx^2)^{5/2}}+\frac{4x\text{ArcSin}(ax)}{15c^2(c-a^2cx^2)^{3/2}}+$$

```
[Out] 1/5*x*arcsin(a*x)/c/(-a^2*c*x^2+c)^(5/2)+4/15*x*arcsin(a*x)/c^2/(-a^2*c*x^2
+c)^(3/2)-1/20/a/c^3/(-a^2*x^2+1)^(3/2)/(-a^2*c*x^2+c)^(1/2)+8/15*x*arcsin(
a*x)/c^3/(-a^2*c*x^2+c)^(1/2)-2/15/a/c^3/(-a^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^
(1/2)+4/15*ln(-a^2*x^2+1)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4747, 4745, 266, 267}

$$\frac{8x\text{ArcSin}(ax)}{15c^3\sqrt{c-a^2cx^2}}+\frac{4x\text{ArcSin}(ax)}{15c^2(c-a^2cx^2)^{3/2}}+\frac{x\text{ArcSin}(ax)}{5c(c-a^2cx^2)^{5/2}}-\frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}-\frac{1}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}}+\frac{4\sqrt{1-a^2x^2}\log(1-a^2x^2)}{15ac^3\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -1/20*1/(a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - 2/(15*a*c^3*Sqrt[
1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(5*c*(c - a^2*c*x^2)^(5
/2)) + (4*x*ArcSin[a*x])/(15*c^2*(c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x])
/(15*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(15*
a*c^3*Sqrt[c - a^2*c*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)}{(c-a^2cx^2)^{7/2}}\,dx = \frac{x\sin^{-1}(ax)}{5c\,(c-a^2cx^2)^{5/2}} + \frac{4\int \frac{\sin^{-1}(ax)}{(c-a^2cx^2)^{5/2}}\,dx}{5c} - \frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{5c\,(c-a^2cx^2)^{5/2}} + \frac{4x\sin^{-1}(ax)}{15c^2\,(c-a^2cx^2)^{3/2}} + \frac{8\int}{}$$

$$= -\frac{1}{20ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{5c\,(c-a^2cx^2)}$$

$$= -\frac{1}{20ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{5c\,(c-a^2cx^2)}$$

Mathematica [A]
time = 0.14, size = 111, normalized size = 0.53

$$-\frac{\sqrt{c-a^2cx^2}\left(4ax(15-20a^2x^2+8a^4x^4)\,\text{ArcSin}(ax)+\sqrt{1-a^2x^2}\left(-11+8a^2x^2+16(-1+a^2x^2)^2\log\left(-1+a^2x^2\right)\right)\right)}{60ac^4\left(-1+a^2x^2\right)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -1/60*(Sqrt[c - a^2*c*x^2]*(4*a*x*(15 - 20*a^2*x^2 + 8*a^4*x^4)*ArcSin[a*x]
 + Sqrt[1 - a^2*x^2]*(-11 + 8*a^2*x^2 + 16*(-1 + a^2*x^2)^2*Log[-1 + a^2*x^
2]))/(a*c^4*(-1 + a^2*x^2)^3)
```

Maple [C] Result contains complex when optimal does not.
time = 0.25, size = 409, normalized size = 1.95

method	result
default	$\frac{16i\sqrt{-c\left(a^{2}x^{2}-1\right)}\,\sqrt{-a^{2}x^{2}+1}\,\arcsin(ax)}{15a\,c^{4}\left(a^{2}x^{2}-1\right)}-\frac{\sqrt{-c\left(a^{2}x^{2}-1\right)}\,\left(8a^{5}x^{5}-20a^{3}x^{3}+8i\sqrt{-a^{2}x^{2}+1}\,a^{4}x^{4}+15\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 16/15*I*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*arcsin(
a*x)-1/60*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/
2)*a^4*x^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+8*I*(-a^2*x^2+1)^(1/2))*(
64*I*a^8*x^8+64*(-a^2*x^2+1)^(1/2)*a^7*x^7-280*I*a^6*x^6-248*(-a^2*x^2+1)^(
1/2)*a^5*x^5+160*a^4*x^4*arcsin(a*x)+456*I*a^4*x^4+340*a^3*x^3*(-a^2*x^2+1)
^(1/2)-380*a^2*x^2*arcsin(a*x)-328*I*a^2*x^2-165*a*x*(-a^2*x^2+1)^(1/2)+256
*arcsin(a*x)+88*I)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+28
7*a^2*x^2-64)/a-8/15*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x
^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)
```

Maxima [A]
time = 0.51, size = 149, normalized size = 0.71

$$-\frac{1}{60}\,a\left(\frac{3}{\left(a^{6}c^{\frac{5}{2}}x^{4}-2\,a^{4}c^{\frac{5}{2}}x^{2}+a^{2}c^{\frac{5}{2}}\right)c}-\frac{8}{\left(a^{4}c^{\frac{3}{2}}x^{2}-a^{2}c^{\frac{3}{2}}\right)c^{2}}+\frac{16\,\log\left(x^{2}-\frac{1}{a^{2}}\right)}{a^{2}c^{\frac{7}{2}}}\right)+\frac{1}{15}\left(\frac{8\,x}{\sqrt{-a^{2}cx^{2}+c}\,c^{3}}+\frac{4\,x}{\left(-a^{2}cx^{2}+c\right)^{\frac{3}{2}}c^{2}}+\frac{3\,x}{\left(-a^{2}cx^{2}+c\right)^{\frac{5}{2}}c}\right)\arcsin\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] -1/60*a*(3/((a^6*c^(5/2)*x^4 - 2*a^4*c^(5/2)*x^2 + a^2*c^(5/2))*c) - 8/((a^
4*c^(3/2)*x^2 - a^2*c^(3/2))*c^2) + 16*log(x^2 - 1/a^2)/(a^2*c^(7/2))) + 1/
15*(8*x/(sqrt(-a^2*c*x^2 + c)*c^3) + 4*x/((-a^2*c*x^2 + c)^(3/2)*c^2) + 3*x
/((-a^2*c*x^2 + c)^(5/2)*c))*arcsin(a*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 + 6*
a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\operatorname{asin}\left(ax\right)}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)/(-a**2*c*x**2+c)**(7/2),x)
```

```
[Out] Integral(asin(a*x)/(-c*(a*x - 1)*(a*x + 1))**(7/2), x)
```

Giac [A]
time = 0.46, size = 128, normalized size = 0.61

$$-\frac{1}{60}\sqrt{c}\left(\frac{16\log\left(|a^2x^2-1|\right)}{ac^4}-\frac{24\,a^4x^4-56\,a^2x^2+35}{\left(a^2x^2-1\right)^2ac^4}\right)-\frac{\sqrt{-a^2cx^2+c}\left(4\left(\frac{2\,a^4x^2}{c}-\frac{5\,a^2}{c}\right)x^2+\frac{15}{c}\right)x\arcsin\left(ax\right)}{15\left(a^2cx^2-c\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] -1/60*sqrt(c)*(16*log(abs(a^2*x^2 - 1))/(a*c^4) - (24*a^4*x^4 - 56*a^2*x^2
+ 35)/((a^2*x^2 - 1)^2*a*c^4)) - 1/15*sqrt(-a^2*c*x^2 + c)*(4*(2*a^4*x^2/c
- 5*a^2/c)*x^2 + 15/c)*x*arcsin(a*x)/(a^2*c*x^2 - c)^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{asin}(a\,x)}{{\left(c-a^2\,c\,x^2\right)}^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)/(c - a^2*c*x^2)^(7/2),x)
```

```
[Out] int(asin(a*x)/(c - a^2*c*x^2)^(7/2), x)
```

3.141 $\int \frac{(fx)^{3/2}(a+b\textbf{ArcSin}(cx))}{\sqrt{1-c^2x^2}}\,dx$

Optimal. Leaf size=79

$$\frac{2(fx)^{5/2}(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)}{5f}-\frac{4bc(fx)^{7/2}\text{HypergeometricPFQ}\left(\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4}\right.\right.}{35f^2}$$

```
[Out] 2/5*(f*x)^(5/2)*(a+b*arcsin(c*x))*hypergeom([1/2, 5/4],[9/4],c^2*x^2)/f-4/3
5*b*c*(f*x)^(7/2)*hypergeom([1, 7/4, 7/4],[9/4, 11/4],c^2*x^2)/f^2
```

Rubi [A]
time = 0.07, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$, Rules used = {4805}

$$\frac{2(fx)^{5/2}\,{}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)(a+b\text{ArcSin}(cx))}{5f}-\frac{4bc(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2],x]
```

```
[Out] (2*(f*x)^(5/2)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 5/4, 9/4, c^2*x^2
])/(5*f) - (4*b*c*(f*x)^(7/2)*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4},
 c^2*x^2])/(35*f^2)
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx=\frac{2(fx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,{}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)}{5f}-\frac{4bc(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};\right.}{35f^2}$$

Mathematica [A]
time = 0.03, size = 68, normalized size = 0.86

$$\frac{2}{35}x(fx)^{3/2}\left(7(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)-2bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\},c^2x^2\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2],x]
```

```
[Out] (2*x*(f*x)^(3/2)*(7*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 5/4, 9/4, c^
2*x^2] - 2*b*c*x*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, c^2*x^2]))/3
5
```

Maple [F]
time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{(fx)^{\frac{3}{2}} (a + b \arcsin (cx))}{\sqrt{-c^2x^2 + 1}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="ma
xima")
```

```
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*x^2 + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*(b*f*x*arcsin(c*x) + a*f*x)*sqrt(f*x)/(c^2*x^2
 - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(fx)^{\frac{3}{2}} (a + b \operatorname{asin}(cx))}{\sqrt{-(cx - 1)(cx + 1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(3/2)*(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral((f*x)**(3/2)*(a + b*asin(c*x))/sqrt(-(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="gi
ac")
```

```
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(f\,x\right)}^{3/2}}{\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f*x)^(3/2))/(1 - c^2*x^2)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f*x)^(3/2))/(1 - c^2*x^2)^(1/2), x)
```

3.142 $\int \frac{(fx)^{3/2}(a+b\,\mathbf{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=137

$$\frac{2(fx)^{5/2}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)}{5f\sqrt{d-c^2dx^2}}-\frac{4bc(fx)^{7/2}\sqrt{1-c^2x^2}\,\text{Hypergeom}}{35f^2\sqrt{d}}$$

```
[Out] 2/5*(f*x)^(5/2)*(a+b*arcsin(c*x))*hypergeom([1/2, 5/4],[9/4],c^2*x^2)*(-c^2
*x^2+1)^(1/2)/f/(-c^2*d*x^2+d)^(1/2)-4/35*b*c*(f*x)^(7/2)*hypergeom([1, 7/4
, 7/4],[9/4, 11/4],c^2*x^2)*(-c^2*x^2+1)^(1/2)/f^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]

time = 0.09, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.032$, Rules used = {4805}

$$\frac{2\sqrt{1-c^2x^2}\,(fx)^{5/2}\,{}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)(a+b\text{ArcSin}(cx))}{5f\sqrt{d-c^2dx^2}}-\frac{4bc\sqrt{1-c^2x^2}\,(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*(f*x)^(5/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2,
 5/4, 9/4, c^2*x^2])/(5*f*Sqrt[d - c^2*d*x^2]) - (4*b*c*(f*x)^(7/2)*Sqrt[1
- c^2*x^2]*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, c^2*x^2])/(35*f^2*
Sqrt[d - c^2*d*x^2])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] && !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{(fx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\ &= \frac{2(fx)^{5/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right){}_2F_1\left(\frac{1}{2},\frac{5}{4};\frac{9}{4};c^2x^2\right)}{5f\sqrt{d-c^2dx^2}}-\frac{4bc(fx)^{7/2}\sqrt{1-}}{35}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 97, normalized size = 0.71

$$-\frac{2x(fx)^{3/2}\sqrt{1-c^2x^2}\left(-7(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)+2bcx\text{HypergeometricPFQ}\left(\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\},c^2x^2\right)\right)}{35\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (-2*x*(f*x)^(3/2)*Sqrt[1 - c^2*x^2]*(-7*(a + b*ArcSin[c*x])*Hypergeometric2
F1[1/2, 5/4, 9/4, c^2*x^2] + 2*b*c*x*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4,
 11/4}, c^2*x^2]))/(35*Sqrt[d - c^2*d*x^2])
```

Maple [F]
time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{(fx)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)}{\sqrt{-c^2d\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*f*x*arcsin(c*x) + a*f*x)*sqrt(f*x)/(c^2*d
*x^2 - d), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(3/2)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(f\,x)}^{3/2}}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f*x)^(3/2))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f*x)^(3/2))/(d - c^2*d*x^2)^(1/2), x)
```

3.143 $\int x^m (d - c^2 d x^2)^3 (a + b\mathbf{ArcSin}(cx)) \, dx$

Optimal. Leaf size=315

$$-\frac{bcd^3(2271 + 1329m + 284m^2 + 27m^3 + m^4)\, x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2(7+m)^2} + \frac{bc^3d^3(9+m)(13+2m)x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2(7+m)^2} - b$$

```
[Out] d^3*x^(1+m)*(a+b*arcsin(c*x))/(1+m)-3*c^2*d^3*x^(3+m)*(a+b*arcsin(c*x))/(3+
m)+3*c^4*d^3*x^(5+m)*(a+b*arcsin(c*x))/(5+m)-c^6*d^3*x^(7+m)*(a+b*arcsin(c*
x))/(7+m)-3*b*c*d^3*(35*m^3+455*m^2+1813*m+2161)*x^(2+m)*hypergeom([1/2, 1+
1/2*m],[2+1/2*m],c^2*x^2)/(m^2+3*m+2)/(m^3+15*m^2+71*m+105)^2-b*c*d^3*(m^4+
27*m^3+284*m^2+1329*m+2271)*x^(2+m)*(-c^2*x^2+1)^(1/2)/(7+m)^2/(m^2+8*m+15)
^2+b*c^3*d^3*(9+m)*(13+2*m)*x^(4+m)*(-c^2*x^2+1)^(1/2)/(5+m)^2/(7+m)^2-b*c^
5*d^3*x^(6+m)*(-c^2*x^2+1)^(1/2)/(7+m)^2
```

Rubi [A]
time = 1.34, antiderivative size = 315, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {276, 4777, 12, 1823, 1281, 470, 371}

$$-\frac{c^6d^3x^{m+7}(a+b\text{ArcSin}(cx))}{m+7} + \frac{3c^4d^3x^{m+5}(a+b\text{ArcSin}(cx))}{m+5} - \frac{3c^2d^3x^{m+3}(a+b\text{ArcSin}(cx))}{m+3} + \frac{d^3x^{m+1}(a+b\text{ArcSin}(cx))}{m+1} - \frac{3bcd^3(35m^3+455m^2+1813m+2161)\,x^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{(m+1)(m+2)(m+3)^2(m+5)^2(m+7)^2} - \frac{bcd^3(m^4+27m^3+284m^2+1329m+2271)\sqrt{1-c^2x^2}\,x^{m+2}}{(m+3)^2(m+5)^2(m+7)^2} - \frac{bc^5d^3\sqrt{1-c^2x^2}\,x^{m+6}}{(m+7)^2} + \frac{bc^3d^3(m+9)(2m+13)\sqrt{1-c^2x^2}\,x^{m+4}}{(m+5)^2(m+7)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d^3*(2271 + 1329*m + 284*m^2 + 27*m^3 + m^4)*x^(2 + m)*Sqrt[1 - c^2*
x^2])/((3 + m)^2*(5 + m)^2*(7 + m)^2)) + (b*c^3*d^3*(9 + m)*(13 + 2*m)*x^(4
 + m)*Sqrt[1 - c^2*x^2])/((5 + m)^2*(7 + m)^2) - (b*c^5*d^3*x^(6 + m)*Sqrt[
1 - c^2*x^2])/(7 + m)^2 + (d^3*x^(1 + m)*(a + b*ArcSin[c*x]))/(1 + m) - (3*
c^2*d^3*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) + (3*c^4*d^3*x^(5 + m)*(a +
b*ArcSin[c*x]))/(5 + m) - (c^6*d^3*x^(7 + m)*(a + b*ArcSin[c*x]))/(7 + m) -
 (3*b*c*d^3*(2161 + 1813*m + 455*m^2 + 35*m^3)*x^(2 + m)*Hypergeometric2F1[
1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2*(
7 + m)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)\,dx = \frac{d^3x^{1+m}(a+b\sin^{-1}(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(a+b\sin^{-1}(cx))}{3+m} + \frac{3c^4d^3x^{5}\cdots}{\cdots}$$

$$= \frac{d^3x^{1+m}(a+b\sin^{-1}(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(a+b\sin^{-1}(cx))}{3+m} + \frac{3c^4d^3x^{5}\cdots}{\cdots}$$

$$= -\frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2} + \frac{d^3x^{1+m}(a+b\sin^{-1}(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(\cdots}{3\cdots}$$

$$= \frac{bc^3d^3(9+m)(13+2m)x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2(7+m)^2} - \frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2}$$

$$= -\frac{bcd^3(2271+1329m+284m^2+27m^3+m^4)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2(7+m)^2} + \cdots$$

$$= -\frac{bcd^3(2271+1329m+284m^2+27m^3+m^4)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2(7+m)^2} + \cdots$$

Mathematica [A]
time = 0.34, size = 256, normalized size = 0.81

$$\frac{x^{1+m}\left((d-c^2dx^2)^3(a+b\text{ArcSin}(cx)) - \frac{bcd^3x\,\text{Hypergeometric2F1}\left(-\frac{5}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)}{2+m} + \frac{6d\left((d-c^2dx^2)^2(a+b\text{ArcSin}(cx)) - \frac{bcd^2x\,\text{Hypergeometric2F1}\left(-\frac{3}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)}{2+m} - \frac{4d^2\left((2+m)(-3+c^2x^2+m(-1+c^2x^2))(a+b\text{ArcSin}(cx)) + bc(1+m)x\,\text{Hypergeometric2F1}\left(-\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right) + 2bcx\,\text{Hypergeometric2F1}\left(\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)\right)}{(1+m)(2+m)(3+m)}\right)}{5+m}\right)}{7+m}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]) - (b*c*d^3*x*Hypergeometr
ic2F1[-5/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2 + m) + (6*d*((d - c^2*d*x^2)^2*(
a + b*ArcSin[c*x]) - (b*c*d^2*x*Hypergeometric2F1[-3/2, 1 + m/2, 2 + m/2, c
^2*x^2])/(2 + m) - (4*d^2*((2 + m)*(-3 + c^2*x^2 + m*(-1 + c^2*x^2))*(a + b
*ArcSin[c*x]) + b*c*(1 + m)*x*Hypergeometric2F1[-1/2, 1 + m/2, 2 + m/2, c^2
*x^2] + 2*b*c*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2]))/((1 + m
)*(2 + m)*(3 + m))))/(5 + m)))/(7 + m)
```

Maple [F]
time = 4.64, size = 0, normalized size = 0.00

$$\int x^{m} \left(-c^{2} d\,x^{2}+d\right)^{3} \left(a+b \arcsin \left(c x\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -a*c^6*d^3*x^(m + 7)/(m + 7) + 3*a*c^4*d^3*x^(m + 5)/(m + 5) - 3*a*c^2*d^3*
x^(m + 3)/(m + 3) + a*d^3*x^(m + 1)/(m + 1) - (((b*c^6*d^3*m^3 + 9*b*c^6*d^
3*m^2 + 23*b*c^6*d^3*m + 15*b*c^6*d^3)*x^7 - 3*(b*c^4*d^3*m^3 + 11*b*c^4*d^
3*m^2 + 31*b*c^4*d^3*m + 21*b*c^4*d^3)*x^5 + 3*(b*c^2*d^3*m^3 + 13*b*c^2*d^
3*m^2 + 47*b*c^2*d^3*m + 35*b*c^2*d^3)*x^3 - (b*d^3*m^3 + 15*b*d^3*m^2 + 71
*b*d^3*m + 105*b*d^3)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (
m^4 + 16*m^3 + 86*m^2 + 176*m + 105)*integrate(-((b*c^7*d^3*m^3 + 9*b*c^7*d
^3*m^2 + 23*b*c^7*d^3*m + 15*b*c^7*d^3)*x^7 - 3*(b*c^5*d^3*m^3 + 11*b*c^5*d
^3*m^2 + 31*b*c^5*d^3*m + 21*b*c^5*d^3)*x^5 + 3*(b*c^3*d^3*m^3 + 13*b*c^3*d
^3*m^2 + 47*b*c^3*d^3*m + 35*b*c^3*d^3)*x^3 - (b*c*d^3*m^3 + 15*b*c*d^3*m^2
 + 71*b*c*d^3*m + 105*b*c*d^3)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/(m^4 + 1
6*m^3 - (c^2*m^4 + 16*c^2*m^3 + 86*c^2*m^2 + 176*c^2*m + 105*c^2)*x^2 + 86*
m^2 + 176*m + 105), x))/(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))*x^m, x
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d^{3}\left(\int\left(-ax^{m}\right)dx+\int\left(-bx^{m}\operatorname{asin}{\left(cx\right)}\right)dx+\int 3ac^{2}x^{2}x^{m}\,dx+\int\left(-3ac^{4}x^{4}x^{m}\right)dx+\int ac^{6}x^{6}x^{m}\,dx+\int 3bc^{2}x^{2}x^{m}\operatorname{asin}{\left(cx\right)}\,dx+\int\left(-3bc^{4}x^{4}x^{m}\operatorname{asin}{\left(cx\right)}\right)dx+\int bc^{6}x^{6}x^{m}\operatorname{asin}{\left(cx\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] -d**3*(Integral(-a*x**m, x) + Integral(-b*x**m*asin(c*x), x) + Integral(3*a
*c**2*x**2*x**m, x) + Integral(-3*a*c**4*x**4*x**m, x) + Integral(a*c**6*x*
*6*x**m, x) + Integral(3*b*c**2*x**2*x**m*asin(c*x), x) + Integral(-3*b*c**
4*x**4*x**m*asin(c*x), x) + Integral(b*c**6*x**6*x**m*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)*x^m, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
```

```
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.144 $\int x^m (d - c^2 d x^2)^2 (a + b\mathbf{ArcSin}(cx))\, dx$

Optimal. Leaf size=217

$$-\frac{bcd^2(38+13m+m^2)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2}+\frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2}+\frac{d^2x^{1+m}(a+b\text{ArcSin}(cx))}{1+m}-\frac{2c^2d^2x^{3+m}(a}{3}$$

```
[Out] d^2*x^(1+m)*(a+b*arcsin(c*x))/(1+m)-2*c^2*d^2*x^(3+m)*(a+b*arcsin(c*x))/(3+
m)+c^4*d^2*x^(5+m)*(a+b*arcsin(c*x))/(5+m)-b*c*d^2*(15*m^2+100*m+149)*x^(2+
m)*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(m^2+3*m+2)/(m^2+8*m+15)^2-b
*c*d^2*(m^2+13*m+38)*x^(2+m)*(-c^2*x^2+1)^(1/2)/(3+m)^2/(5+m)^2+b*c^3*d^2*x
^(4+m)*(-c^2*x^2+1)^(1/2)/(5+m)^2
```

Rubi [A]
time = 0.22, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {276, 4777, 12, 1281, 470, 371}

$$\frac{c^4d^2x^{m+5}(a+b\text{ArcSin}(cx))}{m+5}-\frac{2c^2d^2x^{m+3}(a+b\text{ArcSin}(cx))}{m+3}+\frac{d^2x^{m+1}(a+b\text{ArcSin}(cx))}{m+1}-\frac{bcd^2(15m^2+100m+149)\,x^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{(m+1)(m+2)(m+3)^2(m+5)^2}-\frac{bcd^2(m^2+13m+38)\sqrt{1-c^2x^2}\,x^{m+2}}{(m+3)^2(m+5)^2}+\frac{bc^3d^2\sqrt{1-c^2x^2}\,x^{m+4}}{(m+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d^2*(38 + 13*m + m^2)*x^(2 + m)*Sqrt[1 - c^2*x^2])/((3 + m)^2*(5 + m
)^2)) + (b*c^3*d^2*x^(4 + m)*Sqrt[1 - c^2*x^2])/(5 + m)^2 + (d^2*x^(1 + m)*
(a + b*ArcSin[c*x]))/(1 + m) - (2*c^2*d^2*x^(3 + m)*(a + b*ArcSin[c*x]))/(3
 + m) + (c^4*d^2*x^(5 + m)*(a + b*ArcSin[c*x]))/(5 + m) - (b*c*d^2*(149 + 1
00*m + 15*m^2)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x
^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
```

```
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)\,dx = \frac{d^2x^{1+m}(a+b\sin^{-1}(cx))}{1+m} - \frac{2c^2d^2x^{3+m}(a+b\sin^{-1}(cx))}{3+m} + \frac{c^4d^2x^5}{}$$

$$= \frac{d^2x^{1+m}(a+b\sin^{-1}(cx))}{1+m} - \frac{2c^2d^2x^{3+m}(a+b\sin^{-1}(cx))}{3+m} + \frac{c^4d^2x^5}{}$$

$$= \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2} + \frac{d^2x^{1+m}(a+b\sin^{-1}(cx))}{1+m} - \frac{2c^2d^2x^{3+m}(a}{3}$$

$$= -\frac{bcd^2(38+13m+m^2)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2} + \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2}$$

$$= -\frac{bcd^2(38+13m+m^2)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2} + \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2}$$

Mathematica [A]
time = 0.01, size = 187, normalized size = 0.86

$$\frac{x^{1+m}\left((d-c^2dx^2)^2(a+b\text{ArcSin}(cx)) - \frac{bcd^2x\text{Hypergeometric2F1}\left(-\frac{3}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)}{2+m} - \frac{4d^2\left((2+m)(-3+c^2x^2+m(-1+c^2x^2))(a+b\text{ArcSin}(cx))+bc(1+m)x\text{Hypergeometric2F1}\left(-\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)+2bcx\text{Hypergeometric2F1}\left(\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)\right)}{(1+m)(2+m)(3+m)}\right)}{5+m}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]) - (b*c*d^2*x*Hypergeometr
ic2F1[-3/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2 + m) - (4*d^2*((2 + m)*(-3 + c^2
*x^2 + m*(-1 + c^2*x^2))*(a + b*ArcSin[c*x]) + b*c*(1 + m)*x*Hypergeometric
2F1[-1/2, 1 + m/2, 2 + m/2, c^2*x^2] + 2*b*c*x*Hypergeometric2F1[1/2, 1 + m
/2, 2 + m/2, c^2*x^2]))/((1 + m)*(2 + m)*(3 + m))))/(5 + m)
```

Maple [F]
time = 2.76, size = 0, normalized size = 0.00

$$\int x^m\left(-c^2d\,x^2+d\right)^2\left(a+b\arcsin\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] a*c^4*d^2*x^(m + 5)/(m + 5) - 2*a*c^2*d^2*x^(m + 3)/(m + 3) + a*d^2*x^(m +
1)/(m + 1) + (((b*c^4*d^2*m^2 + 4*b*c^4*d^2*m + 3*b*c^4*d^2)*x^5 - 2*(b*c^2
*d^2*m^2 + 6*b*c^2*d^2*m + 5*b*c^2*d^2)*x^3 + (b*d^2*m^2 + 8*b*d^2*m + 15*b
*d^2)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (m^3 + 9*m^2 + 23
*m + 15)*integrate(-((b*c^5*d^2*m^2 + 4*b*c^5*d^2*m + 3*b*c^5*d^2)*x^5 - 2*
(b*c^3*d^2*m^2 + 6*b*c^3*d^2*m + 5*b*c^3*d^2)*x^3 + (b*c*d^2*m^2 + 8*b*c*d^
2*m + 15*b*c*d^2)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/(m^3 - (c^2*m^3 + 9*c
^2*m^2 + 23*c^2*m + 15*c^2)*x^2 + 9*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23
*m + 15)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*x^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^{2}\left(\int ax^{m}\, dx + \int bx^{m}\operatorname{asin}{\left(cx \right)}\, dx + \int \left(-2ac^{2}x^{2}x^{m}\right)\, dx + \int ac^{4}x^{4}x^{m}\, dx + \int \left(-2bc^{2}x^{2}x^{m}\operatorname{asin}{\left(cx \right)}\right)\, dx + \int bc^{4}x^{4}x^{m}\operatorname{asin}{\left(cx \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] d**2*(Integral(a*x**m, x) + Integral(b*x**m*asin(c*x), x) + Integral(-2*a*c
**2*x**2*x**m, x) + Integral(a*c**4*x**4*x**m, x) + Integral(-2*b*c**2*x**2
*x**m*asin(c*x), x) + Integral(b*c**4*x**4*x**m*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)*x^m, x)
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.145 $\int x^m(d-c^2dx^2)(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=129

$$-\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2}+\frac{dx^{1+m}(a+b\text{ArcSin}(cx))}{1+m}-\frac{c^2dx^{3+m}(a+b\text{ArcSin}(cx))}{3+m}-\frac{bcd(7+3m)x^{2+m}\text{Hypergeom}}{(1+m)(2+}$$

```
[Out] d*x^(1+m)*(a+b*arcsin(c*x))/(1+m)-c^2*d*x^(3+m)*(a+b*arcsin(c*x))/(3+m)-b*c
*d*(7+3*m)*x^(2+m)*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(3+m)^2/(m^2
+3*m+2)-b*c*d*x^(2+m)*(-c^2*x^2+1)^(1/2)/(3+m)^2
```

Rubi [A]
time = 0.11, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {14, 4777, 12, 470, 371}

$$-\frac{c^2dx^{m+3}(a+b\text{ArcSin}(cx))}{m+3}+\frac{dx^{m+1}(a+b\text{ArcSin}(cx))}{m+1}-\frac{bcd(3m+7)x^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{(m+1)(m+2)(m+3)^2}-\frac{bcd\sqrt{1-c^2x^2}\,x^{m+2}}{(m+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d*x^(2 + m)*Sqrt[1 - c^2*x^2])/(3 + m)^2) + (d*x^(1 + m)*(a + b*ArcS
in[c*x]))/(1 + m) - (c^2*d*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) - (b*c*d*
(7 + 3*m)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/
((1 + m)*(2 + m)*(3 + m)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\int x^m\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{dx^{1+m}(a+b\sin^{-1}(cx))}{1+m}-\frac{c^2dx^{3+m}(a+b\sin^{-1}(cx))}{3+m}-(bc)\int\frac{dx^1}{}$$

$$=\frac{dx^{1+m}(a+b\sin^{-1}(cx))}{1+m}-\frac{c^2dx^{3+m}(a+b\sin^{-1}(cx))}{3+m}-(bcd)\int\frac{x^1}{}$$

$$=-\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2}+\frac{dx^{1+m}(a+b\sin^{-1}(cx))}{1+m}-\frac{c^2dx^{3+m}(a+b}{3+}$$

$$=-\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2}+\frac{dx^{1+m}(a+b\sin^{-1}(cx))}{1+m}-\frac{c^2dx^{3+m}(a+b}{3+}$$

Mathematica [A]
time = 0.04, size = 118, normalized size = 0.91

$$-\frac{dx^{1+m}\left((2+m)\left(-3+c^2x^2+m(-1+c^2x^2)\right)(a+b\mathrm{ArcSin}(cx))+bc(1+m)x\mathrm{Hypergeometric2F1}\left(-\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)+2bcx\mathrm{Hypergeometric2F1}\left(\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)\right)}{(1+m)(2+m)(3+m)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
[Out] -((d*x^(1 + m)*((2 + m)*(-3 + c^2*x^2 + m*(-1 + c^2*x^2))*(a + b*ArcSin[c*x
]) + b*c*(1 + m)*x*Hypergeometric2F1[-1/2, 1 + m/2, 2 + m/2, c^2*x^2] + 2*b
*c*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2]))/((1 + m)*(2 + m)*(
3 + m)))
```

Maple [F]
time = 2.48, size = 0, normalized size = 0.00

$$\int x^m\left(-c^2d\,x^2+d\right)\left(a+b\arcsin\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -a*c^2*d*x^(m + 3)/(m + 3) + a*d*x^(m + 1)/(m + 1) - (((b*c^2*d*m + b*c^2*d
)*x^3 - (b*d*m + 3*b*d)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 (m^2 + 4*m + 3)*integrate(((b*c^3*d*m + b*c^3*d)*x^3 - (b*c*d*m + 3*b*c*d)
*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/((c^2*m^2 + 4*c^2*m + 3*c^2)*x^2 - m^2
 - 4*m - 3), x))/(m^2 + 4*m + 3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*x^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-ax^{m}\right)dx+\int\left(-bx^{m}\operatorname{asin}\left(cx\right)\right)dx+\int ac^{2}x^{2}x^{m}\,dx+\int bc^{2}x^{2}x^{m}\operatorname{asin}\left(cx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] -d*(Integral(-a*x**m, x) + Integral(-b*x**m*asin(c*x), x) + Integral(a*c**2
*x**2*x**m, x) + Integral(b*c**2*x**2*x**m*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)*x^m, x)
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.01

$$\int x^m \left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.146 $\int \frac{x^m(a+b\text{ArcSin}(cx))}{d-c^2dx^2}\,dx$

Optimal. Leaf size=28

$$\text{Int}\left(\frac{x^m(a+b\text{ArcSin}(cx))}{d-c^2dx^2},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))}{d-c^2dx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x]
```

Rubi steps

$$\int \frac{x^m(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx = \int \frac{x^m(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx$$

Mathematica [A]
time = 2.85, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))}{d-c^2dx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x]
```

Maple [A]
time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))}{-c^2d\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] -integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^m}{c^2x^2-1}\,dx + \int \frac{bx^m \operatorname{asin}{(cx)}}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
[Out] -(Integral(a*x**m/(c**2*x**2 - 1), x) + Integral(b*x**m*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.147 $\int \frac{x^m(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=117

$$\frac{x^{1+m}(a+b\text{ArcSin}(cx))}{2d^2(1-c^2x^2)}-\frac{bcx^{2+m}\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{2d^2(2+m)}+\frac{(1-m)\text{Int}\left(\frac{x^m(a+b\text{ArcSin}(cx))}{d-c^2dx^2},x\right)}{2d}$$

```
[Out] 1/2*x^(1+m)*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-1/2*b*c*x^(2+m)*hypergeom([3
/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^2/(2+m)+1/2*(1-m)*Unintegrable(x^m*(a+b*a
rcsin(c*x))/(-c^2*d*x^2+d),x)/d
```

Rubi [A]
time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - (b*c*x^(2 + m)*Hype
rgeometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(2*d^2*(2 + m)) + ((1 -
m)*Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x])/(2*d)
```

Rubi steps

$$\begin{aligned}\int \frac{x^m(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^2}\,dx &= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{2d^2(1-c^2x^2)}-\frac{(bc)\int \frac{x^{1+m}}{(1-c^2x^2)^{3/2}}\,dx}{2d^2}+\frac{(1-m)\int \frac{x^m(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx}{2d}\\ &= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{2d^2(1-c^2x^2)}-\frac{bcx^{2+m}\,{}_2F_1\left(\frac{3}{2},\frac{2+m}{2};\frac{4+m}{2};c^2x^2\right)}{2d^2(2+m)}+\frac{(1-m)\int \frac{x^m(a+b\sin^{-1}(cx))}{d-c^2dx^2}\,dx}{2d}\end{aligned}$$

Mathematica [A]
time = 4.06, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2, x]
```

Maple [A]
time = 0.80, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\left(a+b\arcsin\left(c x\right)\right)}{\left(-c^{2} d\,x^{2}+d\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)*x^m/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a x^{m}}{c^{4} x^{4} - 2 c^{2} x^{2} + 1}\, dx + \int \frac{b x^{m} \operatorname{asin}{\left(c x \right)}}{c^{4} x^{4} - 2 c^{2} x^{2} + 1}\, dx}{d^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**m/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**m*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^2, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^m\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.148 $\int \frac{x^m(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=208

$$\frac{x^{1+m}(a+b\text{ArcSin}(cx))}{4d^3(1-c^2x^2)^2}+\frac{(3-m)x^{1+m}(a+b\text{ArcSin}(cx))}{8d^3(1-c^2x^2)}-\frac{bc(3-m)x^{2+m}\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{2+m}{2},\frac{4+m}{2},\right.}{8d^3(2+m)}$$

[Out] 1/4*x^(1+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+1/8*(3-m)*x^(1+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)-1/8*b*c*(3-m)*x^(2+m)*hypergeom([3/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^3/(2+m)-1/4*b*c*x^(2+m)*hypergeom([5/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^3/(2+m)+1/8*(1-m)*(3-m)*Unintegrable(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)/d^2

Rubi [A]
time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$,
Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^3}\,dx$$

Verification is not applicable to the result.

[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]

[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m)*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (b*c*(3 - m)*x^(2 + m)*Hypergeometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(8*d^3*(2 + m)) - (b*c*x^(2 + m)*Hypergeometric2F1[5/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 + m)) + ((1 - m)*(3 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x])/(8*d^2)

Rubi steps

$$\begin{aligned}
\int \frac{x^m(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^3}\,dx &= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{4d^3(1-c^2x^2)^2}-\frac{(bc)\int \frac{x^{1+m}}{(1-c^2x^2)^{5/2}}\,dx}{4d^3}+\frac{(3-m)\int \frac{x^m(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^2}\,dx}{4d} \\
&= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{4d^3(1-c^2x^2)^2}+\frac{(3-m)x^{1+m}(a+b\sin^{-1}(cx))}{8d^3(1-c^2x^2)}-\frac{bcx^{2+m}\,{}_2F_1\left(\frac{5}{2},\frac{2+m}{2};\right.}{4d^3(2+m)} \\
&= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{4d^3(1-c^2x^2)^2}+\frac{(3-m)x^{1+m}(a+b\sin^{-1}(cx))}{8d^3(1-c^2x^2)}-\frac{bc(3-m)x^{2+m}\,{}_2F_1\left(\right.}{8d^3(2+}
\end{aligned}$$

Mathematica [A]
time = 4.34, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))}{(d-c^2dx^2)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3, x]
```

Maple [A]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))}{(-c^2d\,x^2+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)*x^m/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*
x^2 - d^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{ax^m}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{bx^m\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**m/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**m*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^m\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.149 $\int x^m(d - c^2dx^2)^{5/2}(a + b\text{ArcSin}(cx))\,dx$

Optimal. Leaf size=635

$$-\frac{15bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}}-\frac{5bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(6+m)\,(8+6m+m^2)\,\sqrt{1-c^2x^2}}-\frac{bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(12+8m+m^2)\,\sqrt{1-c^2x^2}}$$

```
[Out] 5*d*x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(4+m)/(6+m)+x^(1+m)*(-c^
2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(6+m)+15*d^2*x^(1+m)*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/(6+m)/(m^2+6*m+8)-15*b*c*d^2*x^(2+m)*(-c^2*d*x^2+d)^(1/
2)/(2+m)^2/(4+m)/(6+m)/(-c^2*x^2+1)^(1/2)-5*b*c*d^2*x^(2+m)*(-c^2*d*x^2+d)^
(1/2)/(6+m)/(m^2+6*m+8)/(-c^2*x^2+1)^(1/2)-b*c*d^2*x^(2+m)*(-c^2*d*x^2+d)^(
1/2)/(m^2+8*m+12)/(-c^2*x^2+1)^(1/2)+5*b*c^3*d^2*x^(4+m)*(-c^2*d*x^2+d)^(1/
2)/(4+m)^2/(6+m)/(-c^2*x^2+1)^(1/2)+2*b*c^3*d^2*x^(4+m)*(-c^2*d*x^2+d)^(1/2
)/(4+m)/(6+m)/(-c^2*x^2+1)^(1/2)-b*c^5*d^2*x^(6+m)*(-c^2*d*x^2+d)^(1/2)/(6+
m)^2/(-c^2*x^2+1)^(1/2)+15*d^2*x^(1+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1/
2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(6+m)/(m^3+7*m^2+14*m+8)
/(-c^2*x^2+1)^(1/2)-15*b*c*d^2*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1
/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(6+m)/(m^2+5*m+4)/(-
c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.38, antiderivative size = 635, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4787, 4783, 4805, 30, 14, 276}

$$-\frac{15bcd^2x^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2(m+4)(m+6)\sqrt{1-c^2x^2}}+\frac{15d^2x^{m+1}\sqrt{d-c^2dx^2}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m+6)\,(m^3+7m^2+14m+8)\,\sqrt{1-c^2x^2}}+\frac{15d^2x^{m+1}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{(m+6)\,(m^2+6m+8)}+\frac{x^{m+1}(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{m+6}+\frac{5dx^{m+1}(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{(m+4)(m+6)}-\frac{5bcd^2x^{m+2}\sqrt{d-c^2dx^2}}{(m+6)\,(m^2+6m+8)\,\sqrt{1-c^2x^2}}-\frac{bcd^2x^{m+2}\sqrt{d-c^2dx^2}}{(m^2+8m+12)\,\sqrt{1-c^2x^2}}-\frac{15bcd^2x^{m+2}\sqrt{d-c^2dx^2}}{(m+2)^2(m+4)(m+6)\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{m+6}\sqrt{d-c^2dx^2}}{(m+6)^2\sqrt{1-c^2x^2}}+\frac{2bc^3d^2x^{m+4}\sqrt{d-c^2dx^2}}{(m+4)(m+6)\sqrt{1-c^2x^2}}+\frac{5bc^3d^2x^{m+4}\sqrt{d-c^2dx^2}}{(m+4)^2(m+6)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-15*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2]) - (5*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((6 + m)*(8 + 6*
m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((12
+ 8*m + m^2)*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^2*d*x^2
])/((4 + m)^2*(6 + m)*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d^2*x^(4 + m)*Sqrt[d -
c^2*d*x^2])/((4 + m)*(6 + m)*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^(6 + m)*Sqrt
[d - c^2*d*x^2])/((6 + m)^2*Sqrt[1 - c^2*x^2]) + (15*d^2*x^(1 + m)*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x]))/((6 + m)*(8 + 6*m + m^2)) + (5*d*x^(1 + m)
*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((4 + m)*(6 + m)) + (x^(1 + m)*
(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(6 + m) + (15*d^2*x^(1 + m)*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 +
m)/2, c^2*x^2])/((6 + m)*(8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (15*
b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
```

```
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
```

```
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)\,dx = \frac{x^{1+m}\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{6+m} + \frac{(5d)\int x^m\left(d-c^2dx^2\right)^{3/}}{6+}$$

$$= \frac{5dx^{1+m}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(4+m)(6+m)} + \frac{x^{1+m}\left(d-c^2dx^2\right)^{5/2}(}{6+m}$$

$$= -\frac{bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(12+8m+m^2)\sqrt{1-c^2x^2}} + \frac{2bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}}{(4+m)(6+m)\sqrt{1-c^2x^2}} -$$

$$= -\frac{15bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}} - \frac{5bcd^2x^{2+m}\sqrt{d-}}{(2+m)(4+m)(6+}$$

Mathematica [A]
time = 0.83, size = 338, normalized size = 0.53

$$\frac{d^2x^{1+m}\sqrt{d-c^2dx^2}\left(-bc(1+m)(2+m)(4+m)x\left((4+m)(6+m)-2c^2(2+m)(6+m)x^2+c^4(2+m)(4+m)x^4\right)+(1+m)(2+m)^2(4+m)^2(6+m)\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))-5(6+m)\left(bc(1+m)(2+m)x\left(4+m-c^2(2+m)x^2\right)-(1+m)(2+m)^2(4+m)\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))+3(4+m)\left(bc(1+m)x-(1+m)(2+m)\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))-(2+m)(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)+bcx\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},c^2x^2\right)\right)\right)\right)}{(1+m)(2+m)^2(4+m)^2(6+m)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(-(b*c*(1 + m)*(2 + m)*(4 + m)*x*((4 + m
)*(6 + m) - 2*c^2*(2 + m)*(6 + m)*x^2 + c^4*(2 + m)*(4 + m)*x^4)) + (1 + m)
*(2 + m)^2*(4 + m)^2*(6 + m)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]) - 5*(6
 + m)*(b*c*(1 + m)*(2 + m)*x*(4 + m - c^2*(2 + m)*x^2) - (1 + m)*(2 + m)^2*
(4 + m)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]) + 3*(4 + m)*(b*c*(1 + m)*x
- (1 + m)*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (2 + m)*(a + b*Ar
cSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] + b*c*x*Hy
pergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))))/(
(1 + m)*(2 + m)^2*(4 + m)^2*(6 + m)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 3.98, size = 0, normalized size = 0.00

$$\int x^m\left(-c^2d\,x^2+d\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^m, x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m \left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.150 $\int x^m(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=399

$$-\frac{3bcdx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)\sqrt{1-c^2x^2}}-\frac{bcdx^{2+m}\sqrt{d-c^2dx^2}}{(8+6m+m^2)\sqrt{1-c^2x^2}}+\frac{bc^3dx^{4+m}\sqrt{d-c^2dx^2}}{(4+m)^2\sqrt{1-c^2x^2}}+\frac{3dx^{1+m}\sqrt{d-c^2dx^2}\,(a}{8+6m+}$$

```
[Out] x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(4+m)+3*d*x^(1+m)*(a+b*arcsi
n(c*x))*(-c^2*d*x^2+d)^(1/2)/(m^2+6*m+8)-3*b*c*d*x^(2+m)*(-c^2*d*x^2+d)^(1/
2)/(2+m)^2/(4+m)/(-c^2*x^2+1)^(1/2)-b*c*d*x^(2+m)*(-c^2*d*x^2+d)^(1/2)/(m^2
+6*m+8)/(-c^2*x^2+1)^(1/2)+b*c^3*d*x^(4+m)*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(-c
^2*x^2+1)^(1/2)+3*d*x^(1+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1/2+1/2*m],[3
/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(m^3+7*m^2+14*m+8)/(-c^2*x^2+1)^(1/
2)-3*b*c*d*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],c^2
*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(m^2+5*m+4)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.22, antiderivative size = 399, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {4787, 4783, 4805, 30, 14}

$$-\frac{3bcdx^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2(m+4)\sqrt{1-c^2x^2}}+\frac{3dx^{m+1}\sqrt{d-c^2dx^2}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m^3+7m^2+14m+8)\sqrt{1-c^2x^2}}+\frac{3dx^{m+1}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{m^2+6m+8}+\frac{x^{m+1}(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))}{m+4}-\frac{bcdx^{m+2}\sqrt{d-c^2dx^2}}{(m^2+6m+8)\sqrt{1-c^2x^2}}-\frac{3bcdx^{m+2}\sqrt{d-c^2dx^2}}{(m+2)^2(m+4)\sqrt{1-c^2x^2}}+\frac{bc^3dx^{m+4}\sqrt{d-c^2dx^2}}{(m+4)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*Sqrt[1 - c^2*x^
2]) - (b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((8 + 6*m + m^2)*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^(4 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^2*Sqrt[1 - c^2*x^2]
) + (3*d*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8 + 6*m + m^2)
 + (x^(1 + m)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4 + m) + (3*d*x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 +
m)/2, (3 + m)/2, c^2*x^2])/((8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (
3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*Sqrt[1 - c^2
*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int x^m (d-c^2dx^2)^{3/2} \left(a+b\sin^{-1}(cx)\right) dx = \frac{x^{1+m}(d-c^2dx^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{4+m} + \frac{(3d)\int x^m\sqrt{d-c^2dx^2}\,(}{4+}$$

$$= \frac{3dx^{1+m}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8+6m+m^2} + \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a}{4+m}$$

$$= -\frac{3bcdx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)\sqrt{1-c^2x^2}} - \frac{bcdx^{2+m}\sqrt{d-c^2dx^2}}{(8+6m+m^2)\sqrt{1-c^2x^2}} +$$

Mathematica [A]
time = 0.38, size = 237, normalized size = 0.59

$$\frac{dx^{1+m}\sqrt{d-c^2dx^2}\left(-\frac{bcx(4+m-c^2(2+m)x^2)}{(2+m)(4+m)\sqrt{1-c^2x^2}}+(1-c^2x^2)\,(a+b\text{ArcSin}(cx))-\frac{3\left(bc(1+m)x-(1+m)(2+m)\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-(2+m)(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)+bcx\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},c^2x^2\right)\right)}{(1+m)(2+m)^2\sqrt{1-c^2x^2}}\right)}{4+m}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(-((b*c*x*(4 + m - c^2*(2 + m)*x^2))/((2 +
 m)*(4 + m)*Sqrt[1 - c^2*x^2])) + (1 - c^2*x^2)*(a + b*ArcSin[c*x]) - (3*(b
*c*(1 + m)*x - (1 + m)*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (2 +
 m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^
2] + b*c*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c
^2*x^2]))/((1 + m)*(2 + m)^2*Sqrt[1 - c^2*x^2])))/(4 + m)
```

Maple [F]
time = 2.16, size = 0, normalized size = 0.00

$$\int x^{m} \left(-c^{2} d \,x^{2}+d \right)^{\frac{3}{2}} \left(a +b \arcsin \left(c x \right)\right)d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^m, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)*x^m, x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.151 $\int x^m \sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=245

$$-\frac{bcx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2+m}+\frac{x^{1+m}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))\text{Hypergeo}}{(2+3m+m^2)\sqrt{1-}}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(2+m)-b*c*x^(2+m)*(-c^2*d*x^
2+d)^(1/2)/(2+m)^2/(-c^2*x^2+1)^(1/2)+x^(1+m)*(a+b*arcsin(c*x))*hypergeom([
1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(m^2+3*m+2)/(-c^2
*x^2+1)^(1/2)-b*c*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2
*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(1+m)/(2+m)^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4783, 4805, 30}

$$-\frac{bcx^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2\sqrt{1-c^2x^2}}+\frac{x^{m+1}\sqrt{d-c^2dx^2}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m^2+3m+2)\sqrt{1-c^2x^2}}+\frac{x^{m+1}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{m+2}-\frac{bcx^{m+2}\sqrt{d-c^2dx^2}}{(m+2)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*Sqrt[1 - c^2*x^2])) + (x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2 + m) + (x^(1 + m)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*x^(2 + m)*Sqrt[d -
 c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2},
c^2*x^2])/((1 + m)*(2 + m)^2*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int x^m\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)dx=\frac{x^{1+m}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2+m}+\frac{\sqrt{d-c^2dx^2}\int\frac{x^m(a+b\sin^{-1}(c}{\sqrt{1-c^2x^2}}}{(2+m)\sqrt{1-c^2x^2}}$$

$$=-\frac{bcx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2+m}+\frac{x}{}$$

Mathematica [A]
time = 0.05, size = 181, normalized size = 0.74

$$\frac{x^{1+m}\sqrt{d-c^2dx^2}\left((1+m)\left(-bcx+a(2+m)\sqrt{1-c^2x^2}+b(2+m)\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\right)+(2+m)(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)-bcx\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},c^2x^2\right)\right)}{(1+m)(2+m)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*Sqrt[d - c^2*d*x^2]*((1 + m)*(-(b*c*x) + a*(2 + m)*Sqrt[1 - c^2*
x^2] + b*(2 + m)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]) + (2 + m)*(a + b*ArcSin[c*x
])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] - b*c*x*Hypergeome
tricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))/((1 + m)*(2
 + m)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 1.95, size = 0, normalized size = 0.00

$$\int x^m\sqrt{-c^2d\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^m \sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\,\mathrm{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**m*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.152 $\int \frac{x^m(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=163

$$\frac{x^{1+m}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(1+m)\sqrt{d-c^2dx^2}}-\frac{bcx^{2+m}\sqrt{1-c^2x^2}\,\text{Hypergeome}\ldots}{(2\ldots}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(
-c^2*x^2+1)^(1/2)/(1+m)/(-c^2*d*x^2+d)^(1/2)-b*c*x^(2+m)*hypergeom([1, 1+1/
2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/(m^2+3*m+2)/
(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]

time = 0.07, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$, Rules used = {4805}

$$\frac{\sqrt{1-c^2x^2}\,x^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m+1)\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m^2+3m+2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1
+ m)/2, (3 + m)/2, c^2*x^2])/((1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)
*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[d - c^2*d*x^2])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{x^m(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx=\frac{\sqrt{1-c^2x^2}\int\frac{x^m(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}$$

$$=\frac{x^{1+m}\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\,{}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2};c^2x^2\right)}{(1+m)\sqrt{d-c^2dx^2}}-\frac{bcx^{2+m}\sqrt{1-c^2\ldots}}{(2\ldots}$$

Mathematica [A]
time = 0.05, size = 129, normalized size = 0.79

$$\frac{x^{1+m}\sqrt{1-c^2x^2}\left((2+m)(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)-bcx\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},c^2x^2\right)\right)}{(1+m)(2+m)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 - c^2*x^2]*((2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1
[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] - b*c*x*HypergeometricPFQ[{1, 1 + m/2,
 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))/((1 + m)*(2 + m)*Sqrt[d - c^2*d
*x^2])
```

Maple [F]
time = 0.61, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{-c^2d\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\,\mathrm{asin}\,(cx))}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^m\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.153 $\int \frac{x^m(a+b\mathbf{ArcSin}(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=272

$$\frac{x^{1+m}(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{mx^{1+m}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{d(1+m)\sqrt{d-c^2dx^2}}-\frac{bcx^2}{}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)-m*x^(1+m)*(a+b*arcsin(c*x)
)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d/(1+m
)/(-c^2*d*x^2+d)^(1/2)-b*c*x^(2+m)*hypergeom([1, 1+1/2*m],[2+1/2*m],c^2*x^2
)*(-c^2*x^2+1)^(1/2)/d/(2+m)/(-c^2*d*x^2+d)^(1/2)+b*c*m*x^(2+m)*hypergeom([
1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d/(m^
2+3*m+2)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 272, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4793, 4805, 371}

$$\frac{bcm\sqrt{1-c^2x^2}\,x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{d\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}-\frac{m\sqrt{1-c^2x^2}\,x^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{d(m+1)\sqrt{d-c^2dx^2}}+\frac{x^{m+1}(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,x^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{d(m+2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) - (m*x^(1 + m)*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/(d*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2
*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d*(2 + m)*Sqrt[
d - c^2*d*x^2]) + (b*c*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1,
1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(d*(2 + 3*m + m^2)*Sqrt[
d - c^2*d*x^2])
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
```

```
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{x^m(a+b\sin^{-1}(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x^{1+m}(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}} - \frac{m\int \frac{x^m(a+b\sin^{-1}(cx))}{\sqrt{d-c^2dx^2}}\,dx}{d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x^{1+m}}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\;{}_2F_1\left(1,\frac{2+m}{2};\frac{4+m}{2};c^2x^2\right)}{d(2+m)\sqrt{d-c^2dx^2}} - \frac{\left(m\sqrt{1-\right.}{}$$

$$= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{d\sqrt{d-c^2dx^2}} - \frac{mx^{1+m}\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\;{}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2}\right.}{d(1+m)\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 0.16, size = 207, normalized size = 0.76

$$\frac{x^{1+m}\left(-m(2+m)\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)+(1+m)\left((2+m)(a+b\text{ArcSin}(cx))-bcx\sqrt{1-c^2x^2}\,\text{Hypergeometric2F1}\left(1,1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)\right)+bcmx\sqrt{1-c^2x^2}\,\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},c^2x^2\right)\right)}{d(1+m)(2+m)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
[Out] (x^(1 + m)*(-(m*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometri
c2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2]) + (1 + m)*((2 + m)*(a + b*ArcSin[
c*x]) - b*c*x*Sqrt[1 - c^2*x^2]*Hypergeometric2F1[1, 1 + m/2, 2 + m/2, c^2*
x^2]) + b*c*m*x*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2},
{3/2 + m/2, 2 + m/2}, c^2*x^2]))/(d*(1 + m)*(2 + m)*Sqrt[d - c^2*d*x^2])
```

Maple [F]
time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))}{(-c^2d\,x^2+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^4*d^2*x^4 - 2*c^2*
d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} (a + b \operatorname{asin}{(cx)})}{(-d (cx - 1) (cx + 1))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
```

```
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))}{{(d-c^2\,d\,x^2)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.154 $\int \frac{x^m(a+b\textbf{ArcSin}(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=408

$$\frac{x^{1+m}(a+b\text{ArcSin}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{(2-m)x^{1+m}(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{(2-m)mx^{1+m}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{Hyp}}{3d^2(1+m)\sqrt{d-c^2}}$$

```
[Out] 1/3*x^(1+m)*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+1/3*(2-m)*x^(1+m)*(a+b
*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*(2-m)*m*x^(1+m)*(a+b*arcsin(c*x)
)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(1
+m)/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(2-m)*x^(2+m)*hypergeom([1, 1+1/2*m],[2+1/
2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(2+m)/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*x^(
2+m)*hypergeom([2, 1+1/2*m],[2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(2+m)
/(-c^2*d*x^2+d)^(1/2)+1/3*b*c*(2-m)*m*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*
m],[2+1/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(m^2+3*m+2)/(-c^2*d
*x^2+d)^(1/2)
```

Rubi [A]

time = 0.25, antiderivative size = 408, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4793, 4805, 371}

$$\frac{bc(2-m)m\sqrt{1-c^2x^2}\,x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{3d^2\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}-\frac{(2-m)m\sqrt{1-c^2x^2}\,x^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{3d^2(m+1)\sqrt{d-c^2dx^2}}+\frac{(2-m)x^{m+1}(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{x^{m+1}(a+b\text{ArcSin}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{bc(2-m)\sqrt{1-c^2x^2}\,x^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{3d^2(m+2)\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,x^{m+2}\,{}_2F_1\left(2,\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{3d^2(m+2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + ((2 - m)*x^(1
 + m)*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) - ((2 - m)*m*x^(1 +
m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
(3 + m)/2, c^2*x^2])/(3*d^2*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*(2 - m)*x^(
2 + m)*Sqrt[1 - c^2*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2
])/(3*d^2*(2 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2*x^2]*H
ypergeometric2F1[2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(3*d^2*(2 + m)*Sqrt[d -
 c^2*d*x^2]) + (b*c*(2 - m)*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ
[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(3*d^2*(2 + 3*m + m
^2)*Sqrt[d - c^2*d*x^2])
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{x^m(a+b\sin^{-1}(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^{1+m}(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{\cdots}{(1-\cdots}}{3d^2\sqrt{d-c^2dx\cdots}}$$

$$= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)x^{1+m}(a+b\sin^{-1}(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\cdots}{3d^2(2+m\cdots}$$

$$= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)x^{1+m}(a+b\sin^{-1}(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(2-m)x^{2+m}\sqrt{1\cdots}}{3d^2(2\cdots}$$

$$= \frac{x^{1+m}(a+b\sin^{-1}(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{(2-m)x^{1+m}(a+b\sin^{-1}(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{(2-m)mx^{1+m}\sqrt{1\cdots}}{\cdots}$$

Mathematica [A]

time = 0.25, size = 279, normalized size = 0.68

$$\frac{x^{1+m}\left(d(1+m)(2+m)(a+b\text{ArcSin}(cx))-bcd(1+m)x\left(1-c^2x^2\right)^{3/2}\text{Hypergeometric2F1}\left(2,1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)+(2-m)\left(d-c^2dx^2\right)\left((1+m)(2+m)(a+b\text{ArcSin}(cx))-bc(1+m)x\sqrt{1-c^2x^2}\,\text{Hypergeometric2F1}\left(1,1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)-m\sqrt{1-c^2x^2}\left((2+m)(a+b\text{ArcSin}(cx))\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)-bcx\,\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},c^2x^2\right)\right)\right)\right)}{3d^2(1+m)(2+m)\left(d-c^2dx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (x^(1 + m)*(d*(1 + m)*(2 + m)*(a + b*ArcSin[c*x]) - b*c*d*(1 + m)*x*(1 - c^
2*x^2)^(3/2)*Hypergeometric2F1[2, 1 + m/2, 2 + m/2, c^2*x^2] + (2 - m)*(d -
 c^2*d*x^2)*((1 + m)*(2 + m)*(a + b*ArcSin[c*x]) - b*c*(1 + m)*x*Sqrt[1 - c
^2*x^2]*Hypergeometric2F1[1, 1 + m/2, 2 + m/2, c^2*x^2] - m*Sqrt[1 - c^2*x^
2]*((2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2
, c^2*x^2] - b*c*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2]))))/(3*d^2*(1 + m)*(2 + m)*(d - c^2*d*x^2)^(3/2))
```

Maple [F]
time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{x^{m} (a + b \arcsin(c x))}{(-c^{2} d\, x^{2} + d)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^6*d^3*x^6 - 3*c^4
*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^m\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.155 $\int \frac{x^m \mathbf{ArcSin}(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=100

$$\frac{x^{1+m}\text{ArcSin}(ax)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},a^2x^2\right)}{1+m}-\frac{ax^{2+m}\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\right.\right.}{2+3m+m^2}$$

```
[Out] x^(1+m)*arcsin(a*x)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],a^2*x^2)/(1+m)-a
*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],a^2*x^2)/(m^2
+3*m+2)
```

Rubi [A]

time = 0.05, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.045$, Rules used = {4805}

$$\frac{x^{m+1}\text{ArcSin}(ax)\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};a^2x^2\right)}{m+1}-\frac{ax^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;a^2x^2\right)}{m^2+3m+2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^m*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x^(1 + m)*ArcSin[a*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, a^2*x^2
])/(1 + m) - (a*x^(2 + m)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m
/2, 2 + m/2}, a^2*x^2])/(2 + 3*m + m^2)
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{x^m\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx=\frac{x^{1+m}\sin^{-1}(ax)\,{}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2};a^2x^2\right)}{1+m}-\frac{ax^{2+m}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};a^2\right.}{2+3m+m^2}$$

Mathematica [A]

time = 0.02, size = 95, normalized size = 0.95

$$\frac{x^{1+m}\left((2+m)\text{ArcSin}(ax)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},a^2x^2\right)-ax\text{HypergeometricPFQ}\left(\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},a^2x^2\right)\right)}{(1+m)(2+m)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^m*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x^(1 + m)*((2 + m)*ArcSin[a*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2
, a^2*x^2] - a*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m
/2}, a^2*x^2]))/((1 + m)*(2 + m))
```

Maple [F]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{x^m \arcsin(ax)}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arcsin(a*x)/sqrt(-a^2*x^2 + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)/(a^2*x^2 - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \operatorname{asin}(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m*arcsin(a*x)/sqrt(-a^2*x^2 + 1), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^m \operatorname{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^m*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.156 $\int x^4(d - c^2dx^2)(a + b\textbf{ArcSin}(cx))^2 dx$

Optimal. Leaf size=290

$$-\frac{304b^2dx}{3675c^4}-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{32bd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{525c^5}+\frac{16bdx^2\sqrt{1-c^2x^2}\,(a+}{525c^3}$$

```
[Out] -304/3675*b^2*d*x/c^4-152/11025*b^2*d*x^3/c^2-38/6125*b^2*d*x^5+2/343*b^2*c
^2*d*x^7+2/21*b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c^5-4/35*b*d*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))/c^5+2/49*b*d*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c
*x))/c^5+2/35*d*x^5*(a+b*arcsin(c*x))^2+1/7*d*x^5*(-c^2*x^2+1)*(a+b*arcsin(
c*x))^2+32/525*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+16/525*b*d*x^2*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+4/175*b*d*x^4*(a+b*arcsin(c*x))*(-
c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.31, antiderivative size = 290, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12}

$$\frac{1}{7}dx^5(1-c^2x^2)(a+b\text{ArcSin}(cx))^2+\frac{4bdx^4\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{175c}+\frac{2bd(1-c^2x^2)^{7/2}(a+b\text{ArcSin}(cx))}{49c^5}-\frac{4bd(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{35c^5}+\frac{2bd(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{21c^5}+\frac{32bd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{525c^5}+\frac{16bdx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{525c^3}+\frac{2}{35}dx^5(a+b\text{ArcSin}(cx))^2-\frac{304b^2dx}{3675c^4}+\frac{2}{343}b^2c^2dx^7-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-304*b^2*d*x)/(3675*c^4) - (152*b^2*d*x^3)/(11025*c^2) - (38*b^2*d*x^5)/61
25 + (2*b^2*c^2*d*x^7)/343 + (32*b*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/(525*c^5) + (16*b*d*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(525*c^3) +
 (4*b*d*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(21*c^5) - (4*b*d*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(35*c^5) + (2*b*d*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x])
)/(49*c^5) + (2*d*x^5*(a + b*ArcSin[c*x])^2)/35 + (d*x^5*(1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{7}dx^5\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{7}(2d)\int x^4\left(a+b\sin^{-1}(cx)\right)$$

$$=\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{21c^5}-\frac{4bd\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}\right.}{35c^5}$$

$$=\frac{4bdx^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{175c}+\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}\right.}{21c^5}$$

$$=-\frac{16b^2dx}{735c^4}-\frac{8b^2dx^3}{2205c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{16bdx^2\sqrt{1-c^2x^2}}{52}$$

$$=-\frac{16b^2dx}{735c^4}-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{32bd\sqrt{1-c^2x^2}}{5}$$

$$=-\frac{304b^2dx}{3675c^4}-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{32bd\sqrt{1-c^2x}}{}$$

Mathematica [A]
time = 0.18, size = 203, normalized size = 0.70

$$-\frac{d\left(11025a^2c^5x^5(-7+5c^2x^2)+210ab\sqrt{1-c^2x^2}\,(-152-76c^2x^2-57c^4x^4+75c^6x^6)+b^2(31920cx+5320c^3x^3+2394c^5x^5-2250c^7x^7)+210b\left(105ac^5x^5(-7+5c^2x^2)+b\sqrt{1-c^2x^2}\,(-152-76c^2x^2-57c^4x^4+75c^6x^6)\right)\mathrm{ArcSin}(cx)+11025b^2c^5x^5(-7+5c^2x^2)\,\mathrm{ArcSin}(cx)^2\right)}{385875c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/385875*(d*(11025*a^2*c^5*x^5*(-7 + 5*c^2*x^2) + 210*a*b*Sqrt[1 - c^2*x^2
]*(-152 - 76*c^2*x^2 - 57*c^4*x^4 + 75*c^6*x^6) + b^2*(31920*c*x + 5320*c^3
*x^3 + 2394*c^5*x^5 - 2250*c^7*x^7) + 210*b*(105*a*c^5*x^5*(-7 + 5*c^2*x^2)
 + b*Sqrt[1 - c^2*x^2]*(-152 - 76*c^2*x^2 - 57*c^4*x^4 + 75*c^6*x^6))*ArcSi
n[c*x] + 11025*b^2*c^5*x^5*(-7 + 5*c^2*x^2)*ArcSin[c*x]^2))/c^5
```

Maple [A]
time = 0.18, size = 276, normalized size = 0.95

method	result
derivativedivides	$\frac{-d a^2\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d b^2\left(-\frac{\arcsin(cx)^2c^5x^5}{5}-\frac{2\arcsin(cx)\left(3c^4x^4+4c^2x^2+8\right)\sqrt{-c^2x^2+1}}{75}+\frac{38c^5x^5}{6125}+\frac{152c^3x^3}{11025}+\frac{304cx}{3675}\right.}{}$
default	$\frac{-d a^2\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d b^2\left(-\frac{\arcsin(cx)^2c^5x^5}{5}-\frac{2\arcsin(cx)\left(3c^4x^4+4c^2x^2+8\right)\sqrt{-c^2x^2+1}}{75}+\frac{38c^5x^5}{6125}+\frac{152c^3x^3}{11025}+\frac{304cx}{3675}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-d*a^2*(1/7*c^7*x^7-1/5*c^5*x^5)-d*b^2*(-1/5*arcsin(c*x)^2*c^5*x^5-2
/75*arcsin(c*x)*(3*c^4*x^4+4*c^2*x^2+8)*(-c^2*x^2+1)^(1/2)+38/6125*c^5*x^5+
152/11025*c^3*x^3+304/3675*c*x+1/7*arcsin(c*x)^2*c^7*x^7+2/245*arcsin(c*x)*
(5*c^6*x^6+6*c^4*x^4+8*c^2*x^2+16)*(-c^2*x^2+1)^(1/2)-2/343*c^7*x^7)-2*d*a*
b*(1/7*arcsin(c*x)*c^7*x^7-1/5*arcsin(c*x)*c^5*x^5+1/49*c^6*x^6*(-c^2*x^2+1
)^(1/2)-19/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)-76/3675*c^2*x^2*(-c^2*x^2+1)^(1/
2)-152/3675*(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.50, size = 453, normalized size = 1.56

$$-\frac{1}{7}\,b^2c^2dx^7\arcsin\left(cx\right)^2-\frac{1}{7}\,a^2c^2dx^7+\frac{1}{5}\,b^2dx^5\arcsin\left(cx\right)^2+\frac{1}{5}\,a^2dx^5-\frac{2}{245}\left(35\,x^7\arcsin\left(cx\right)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)abc^2d-\frac{2}{25725}\left(105\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin\left(cx\right)-\frac{75\,c^6x^7+126\,c^4x^5+280\,c^2x^3+1680\,x}{c^6}\right)b^2c^2d+\frac{2}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abd+\frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin\left(cx\right)-\frac{9\,c^4x^5+20\,c^2x^3+120\,x}{c^4}\right)b^2d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*b^2*c^2*d*x^7*arcsin(c*x)^2 - 1/7*a^2*c^2*d*x^7 + 1/5*b^2*d*x^5*arcsin
(c*x)^2 + 1/5*a^2*d*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)
*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16
*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^2*d - 2/25725*(105*(5*sqrt(-c^2*x^2 + 1)*
x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*
sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2
*x^3 + 1680*x)/c^6)*b^2*c^2*d + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2
 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)
*a*b*d + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^
2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 +
 120*x)/c^4)*b^2*d
```

Fricas [A]
time = 1.68, size = 229, normalized size = 0.79

$$-\frac{1125\,(49\,a^2-2\,b^2)c^7dx^7-63\,(1225\,a^2-38\,b^2)c^5dx^5+5320\,b^2c^3dx^3+31920\,b^2cdx+11025\,(5\,b^2c^7dx^7-7\,b^2c^5dx^5)\arcsin\left(cx\right)^2+22050\,(5\,abc^7dx^7-7\,abc^5dx^5)\arcsin\left(cx\right)+210\,(75\,abc^6dx^6-57\,abc^4dx^4-76\,abc^2dx^2-152\,abd+(75\,b^2c^6dx^6-57\,b^2c^4dx^4-76\,b^2c^2dx^2-152\,b^2d)\arcsin\left(cx\right))\sqrt{-c^2x^2+1}}{385875\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/385875*(1125*(49*a^2 - 2*b^2)*c^7*d*x^7 - 63*(1225*a^2 - 38*b^2)*c^5*d*x
^5 + 5320*b^2*c^3*d*x^3 + 31920*b^2*c*d*x + 11025*(5*b^2*c^7*d*x^7 - 7*b^2*
c^5*d*x^5)*arcsin(c*x)^2 + 22050*(5*a*b*c^7*d*x^7 - 7*a*b*c^5*d*x^5)*arcsin
(c*x) + 210*(75*a*b*c^6*d*x^6 - 57*a*b*c^4*d*x^4 - 76*a*b*c^2*d*x^2 - 152*a
*b*d + (75*b^2*c^6*d*x^6 - 57*b^2*c^4*d*x^4 - 76*b^2*c^2*d*x^2 - 152*b^2*d)
*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [**A**]
time = 1.20, size = 388, normalized size = 1.34

$$\begin{cases} - \frac{a^{2} c^{2} d x^{7}}{7} + \frac{a^{2} d x^{5}}{5} - \frac{2 a b c^{2} d x^{7} \operatorname{asin}{\left(c x \right)}}{7} - \frac{2 a b c d x^{6} \sqrt{- c^{2} x^{2} + 1}}{49} + \frac{2 a b d x^{5} \operatorname{asin}{\left(c x \right)}}{5} + \frac{38 a b d x^{4} \sqrt{- c^{2} x^{2} + 1}}{1225 c} + \frac{152 a b d x^{2} \sqrt{- c^{2} x^{2} + 1}}{3675 c^{3}} + \frac{304 a b d \sqrt{- c^{2} x^{2} + 1}}{3675 c^{5}} - \frac{b^{2} c^{2} d x^{7} \operatorname{asin}^{2}{\left(c x \right)}}{7} + \frac{2 b^{2} c^{2} d x^{7}}{343} - \frac{2 b^{2} c d x^{6} \sqrt{- c^{2} x^{2} + 1} \operatorname{asin}{\left(c x \right)}}{49} + \frac{b^{2} d x^{5} \operatorname{asin}^{2}{\left(c x \right)}}{5} - \frac{38 b^{2} d x^{5}}{6125} + \frac{38 b^{2} d x^{4} \sqrt{- c^{2} x^{2} + 1} \operatorname{asin}{\left(c x \right)}}{1225 c} - \frac{152 b^{2} d x^{3}}{11025 c^{2}} + \frac{152 b^{2} d x^{2} \sqrt{- c^{2} x^{2} + 1} \operatorname{asin}{\left(c x \right)}}{3675 c^{3}} - \frac{304 b^{2} d x}{3675 c^{4}} + \frac{304 b^{2} d \sqrt{- c^{2} x^{2} + 1} \operatorname{asin}{\left(c x \right)}}{3675 c^{5}} & \text{for}\: c \neq 0 \\\frac{a^{2} d x^{5}}{5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**7/7 + a**2*d*x**5/5 - 2*a*b*c**2*d*x**7*asin(c*x
)/7 - 2*a*b*c*d*x**6*sqrt(-c**2*x**2 + 1)/49 + 2*a*b*d*x**5*asin(c*x)/5 + 3
8*a*b*d*x**4*sqrt(-c**2*x**2 + 1)/(1225*c) + 152*a*b*d*x**2*sqrt(-c**2*x**2
 + 1)/(3675*c**3) + 304*a*b*d*sqrt(-c**2*x**2 + 1)/(3675*c**5) - b**2*c**2*
d*x**7*asin(c*x)**2/7 + 2*b**2*c**2*d*x**7/343 - 2*b**2*c*d*x**6*sqrt(-c**2
*x**2 + 1)*asin(c*x)/49 + b**2*d*x**5*asin(c*x)**2/5 - 38*b**2*d*x**5/6125
+ 38*b**2*d*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(1225*c) - 152*b**2*d*x**3/
(11025*c**2) + 152*b**2*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3675*c**3) -
 304*b**2*d*x/(3675*c**4) + 304*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3675
*c**5), Ne(c, 0)), (a**2*d*x**5/5, True))
```

Giac [**A**]
time = 0.44, size = 495, normalized size = 1.71

$$-\frac{1}{7} \, a^{2} c^{2} d x^{7} + \frac{1}{5} \, a^{2} d x^{5} - \frac{{\left(c^{2} x^{2} - 1\right)}^{3} b^{2} d x \arcsin\left(c x\right)^{2}}{7 \, c^{4}} - \frac{2 \, {\left(c^{2} x^{2} - 1\right)}^{3} a b d x \arcsin\left(c x\right)}{7 \, c^{4}} - \frac{8 \, {\left(c^{2} x^{2} - 1\right)}^{2} b^{2} d x \arcsin\left(c x\right)^{2}}{35 \, c^{4}} + \frac{2 \, {\left(c^{2} x^{2} - 1\right)}^{3} b^{2} d x}{343 \, c^{4}} - \frac{16 \, {\left(c^{2} x^{2} - 1\right)}^{2} a b d x \arcsin\left(c x\right)}{35 \, c^{4}} - \frac{{\left(c^{2} x^{2} - 1\right)} b^{2} d x \arcsin\left(c x\right)^{2}}{35 \, c^{4}} - \frac{2 \, {\left(c^{2} x^{2} - 1\right)}^{3} \sqrt{-c^{2} x^{2} + 1} b^{2} d \arcsin\left(c x\right)}{49 \, c^{5}} + \frac{484 \, {\left(c^{2} x^{2} - 1\right)}^{2} b^{2} d x}{42875 \, c^{4}} - \frac{2 \, {\left(c^{2} x^{2} - 1\right)} a b d x \arcsin\left(c x\right)}{35 \, c^{4}} + \frac{2 \, b^{2} d x \arcsin\left(c x\right)^{2}}{35 \, c^{4}} - \frac{2 \, {\left(c^{2} x^{2} - 1\right)}^{3} \sqrt{-c^{2} x^{2} + 1} a b d}{49 \, c^{5}} - \frac{16 \, {\left(c^{2} x^{2} - 1\right)}^{2} \sqrt{-c^{2} x^{2} + 1} b^{2} d \arcsin\left(c x\right)}{175 \, c^{5}} - \frac{3358 \, {\left(c^{2} x^{2} - 1\right)} b^{2} d x}{385875 \, c^{4}} + \frac{4 \, a b d x \arcsin\left(c x\right)}{35 \, c^{4}} - \frac{16 \, {\left(c^{2} x^{2} - 1\right)}^{2} \sqrt{-c^{2} x^{2} + 1} a b d}{175 \, c^{5}} + \frac{2 \, {\left(-c^{2} x^{2} + 1\right)}^{\frac{3}{2}} b^{2} d \arcsin\left(c x\right)}{105 \, c^{5}} - \frac{37384 \, b^{2} d x}{385875 \, c^{4}} + \frac{2 \, {\left(-c^{2} x^{2} + 1\right)}^{\frac{3}{2}} a b d}{105 \, c^{5}} + \frac{4 \, \sqrt{-c^{2} x^{2} + 1} b^{2} d \arcsin\left(c x\right)}{35 \, c^{5}} + \frac{4 \, \sqrt{-c^{2} x^{2} + 1} a b d}{35 \, c^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/7*a^2*c^2*d*x^7 + 1/5*a^2*d*x^5 - 1/7*(c^2*x^2 - 1)^3*b^2*d*x*arcsin(c*x
)^2/c^4 - 2/7*(c^2*x^2 - 1)^3*a*b*d*x*arcsin(c*x)/c^4 - 8/35*(c^2*x^2 - 1)^
2*b^2*d*x*arcsin(c*x)^2/c^4 + 2/343*(c^2*x^2 - 1)^3*b^2*d*x/c^4 - 16/35*(c^
2*x^2 - 1)^2*a*b*d*x*arcsin(c*x)/c^4 - 1/35*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*
x)^2/c^4 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^5 +
484/42875*(c^2*x^2 - 1)^2*b^2*d*x/c^4 - 2/35*(c^2*x^2 - 1)*a*b*d*x*arcsin(c
*x)/c^4 + 2/35*b^2*d*x*arcsin(c*x)^2/c^4 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x
^2 + 1)*a*b*d/c^5 - 16/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(
```

```
c*x)/c^5 - 3358/385875*(c^2*x^2 - 1)*b^2*d*x/c^4 + 4/35*a*b*d*x*arcsin(c*x)
/c^4 - 16/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d/c^5 + 2/105*(-c^2*x^
2 + 1)^(3/2)*b^2*d*arcsin(c*x)/c^5 - 37384/385875*b^2*d*x/c^4 + 2/105*(-c^2
*x^2 + 1)^(3/2)*a*b*d/c^5 + 4/35*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^5 +
 4/35*sqrt(-c^2*x^2 + 1)*a*b*d/c^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
[Out] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.157 $\int x^3(d-c^2dx^2)\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=202

$$-\frac{b^2dx^2}{24c^2}-\frac{1}{72}b^2dx^4+\frac{1}{108}b^2c^2dx^6+\frac{bdx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{12c^3}+\frac{bdx^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{18c}-\frac{1}{18}$$

```
[Out] -1/24*b^2*d*x^2/c^2-1/72*b^2*d*x^4+1/108*b^2*c^2*d*x^6-1/24*d*(a+b*arcsin(c
*x))^2/c^4+1/12*d*x^4*(a+b*arcsin(c*x))^2+1/6*d*x^4*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2+1/12*b*d*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+1/18*b*d*x^3*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c-1/18*b*c*d*x^5*(a+b*arcsin(c*x))*(-c
^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.38, antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4787, 4723, 4795, 4737, 30, 4783}

$$-\frac{d(a+b\text{ArcSin}(cx))^2}{24c^4}-\frac{1}{18}bcdx^5\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{6}dx^4\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2+\frac{bdx^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{18c}+\frac{bdx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{12c^3}+\frac{1}{12}dx^4(a+b\text{ArcSin}(cx))^2+\frac{1}{108}b^2c^2dx^6-\frac{b^2dx^2}{24c^2}-\frac{1}{72}b^2dx^4$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/24*(b^2*d*x^2)/c^2 - (b^2*d*x^4)/72 + (b^2*c^2*d*x^6)/108 + (b*d*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(12*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(18*c) - (b*c*d*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/18 - (d*(a + b*ArcSin[c*x])^2)/(24*c^4) + (d*x^4*(a + b*ArcSin[c*x])^2)/1
2 + (d*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/6
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^3(d-c^2dx^2)\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{6}dx^4(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}d\int x^3\left(a+b\sin^{-1}(cx)\right)^2\,d$$

$$= -\frac{1}{18}bcdx^5\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)+\frac{1}{12}dx^4\left(a+b\sin^{-1}(cx)\right)^{\cdot}$$

$$= \frac{1}{108}b^2c^2dx^6+\frac{bdx^3\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}{18c}-\frac{1}{18}bcdx^5\sqrt{1-\cdot}$$

$$= -\frac{1}{72}b^2dx^4+\frac{1}{108}b^2c^2dx^6+\frac{bdx\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}{12c^3}+\frac{bd\cdot}{}$$

$$= -\frac{b^2dx^2}{24c^2}-\frac{1}{72}b^2dx^4+\frac{1}{108}b^2c^2dx^6+\frac{bdx\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(c\cdot\right.}{12c^3}$$

Mathematica [A]
time = 0.11, size = 192, normalized size = 0.95

$$-\frac{d\left(b^2c^2x^2(9+3c^2x^2-2c^4x^4)+6abcx\sqrt{1-c^2x^2}\,(-3-2c^2x^2+2c^4x^4)+9a^2(1-6c^4x^4+4c^6x^6)+6b\left(bcx\sqrt{1-c^2x^2}\,(-3-2c^2x^2+2c^4x^4)+3a(1-6c^4x^4+4c^6x^6)\right)\text{ArcSin}(cx)+9b^2(1-6c^4x^4+4c^6x^6)\,\text{ArcSin}(cx)^2\right)}{216c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/216*(d*(b^2*c^2*x^2*(9 + 3*c^2*x^2 - 2*c^4*x^4) + 6*a*b*c*x*Sqrt[1 - c^2
*x^2]*(-3 - 2*c^2*x^2 + 2*c^4*x^4) + 9*a^2*(1 - 6*c^4*x^4 + 4*c^6*x^6) + 6*
b*(b*c*x*Sqrt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 2*c^4*x^4) + 3*a*(1 - 6*c^4*x^
4 + 4*c^6*x^6))*ArcSin[c*x] + 9*b^2*(1 - 6*c^4*x^4 + 4*c^6*x^6)*ArcSin[c*x]
^2))/c^4
```

Maple [A]
time = 0.06, size = 320, normalized size = 1.58

method	result
derivativedivides	$-d\,a^2\left(\frac{1}{6}c^6x^6-\frac{1}{4}c^4x^4\right)-d\,b^2\left(-\frac{\arcsin(cx)^2c^4x^4}{4}+\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}-3cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right.}{16}\right.$
default	$-d\,a^2\left(\frac{1}{6}c^6x^6-\frac{1}{4}c^4x^4\right)-d\,b^2\left(-\frac{\arcsin(cx)^2c^4x^4}{4}+\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}-3cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right.}{16}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-d*a^2*(1/6*c^6*x^6-1/4*c^4*x^4)-d*b^2*(-1/4*arcsin(c*x)^2*c^4*x^4+1
/16*arcsin(c*x)*(-2*c^3*x^3*(-c^2*x^2+1)^(1/2)-3*c*x*(-c^2*x^2+1)^(1/2)+3*a
rcsin(c*x))-1/24*arcsin(c*x)^2+1/128*(2*c^2*x^2+3)^2+1/6*arcsin(c*x)^2*c^6*
x^6-1/144*arcsin(c*x)*(-8*c^5*x^5*(-c^2*x^2+1)^(1/2)-10*c^3*x^3*(-c^2*x^2+1
)^(1/2)-15*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-1/108*c^6*x^6-5/288*c^4*x
^4-5/96*c^2*x^2)-2*d*a*b*(1/6*arcsin(c*x)*c^6*x^6-1/4*c^4*x^4*arcsin(c*x)+1
/36*c^5*x^5*(-c^2*x^2+1)^(1/2)-1/36*c^3*x^3*(-c^2*x^2+1)^(1/2)-1/24*c*x*(-c
^2*x^2+1)^(1/2)+1/24*arcsin(c*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/6*a^2*c^2*d*x^6 + 1/4*a^2*d*x^4 - 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c
^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)
*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^2*d + 1/16*(8*x^4*arcsin(c*x) + (2*sq
rt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*
c)*a*b*d - 1/12*(2*b^2*c^2*d*x^6 - 3*b^2*d*x^4)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 - integrate(1/6*(2*b^2*c^3*d*x^6 - 3*b^2*c*d*x^4)*sqrt(c*
x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 -
 1), x)
```

Fricas [A]
time = 2.28, size = 211, normalized size = 1.04

$$-\frac{2\,(18\,a^2-b^2)c^6dx^6-3\,(18\,a^2-b^2)c^4dx^4+9\,b^2c^2dx^2+9\,(4\,b^2c^6dx^6-6\,b^2c^4dx^4+b^2d)\arcsin(cx)^2+18\,(4\,abc^6dx^6-6\,abc^4dx^4+abd)\arcsin(cx)+6\,(2\,abc^5dx^5-2\,abc^3dx^3-3\,abcdx+(2\,b^2c^5dx^5-2\,b^2c^3dx^3-3\,b^2cdx)\arcsin(cx))\sqrt{-c^2x^2+1}}{216\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/216*(2*(18*a^2 - b^2)*c^6*d*x^6 - 3*(18*a^2 - b^2)*c^4*d*x^4 + 9*b^2*c^2
*d*x^2 + 9*(4*b^2*c^6*d*x^6 - 6*b^2*c^4*d*x^4 + b^2*d)*arcsin(c*x)^2 + 18*(
4*a*b*c^6*d*x^6 - 6*a*b*c^4*d*x^4 + a*b*d)*arcsin(c*x) + 6*(2*a*b*c^5*d*x^5
 - 2*a*b*c^3*d*x^3 - 3*a*b*c*d*x + (2*b^2*c^5*d*x^5 - 2*b^2*c^3*d*x^3 - 3*b
^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A]
time = 0.84, size = 332, normalized size = 1.64

$$\begin{cases} -\frac{a^2c^2dx^6}{6}+\frac{a^2dx^4}{4}-\frac{abc^2dx^6\operatorname{asin}(cx)}{3}-\frac{abcdx^5\sqrt{-c^2x^2+1}}{18}+\frac{abdx^4\operatorname{asin}(cx)}{2}+\frac{abdx^3\sqrt{-c^2x^2+1}}{18c}+\frac{abdx\sqrt{-c^2x^2+1}}{12c^3}-\frac{abd\operatorname{asin}(cx)}{12c^4}-\frac{b^2c^2dx^6\operatorname{asin}^2(cx)}{6}+\frac{b^2c^2dx^6}{108}-\frac{b^2cdx^5\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{18}+\frac{b^2dx^4\operatorname{asin}^2(cx)}{4}-\frac{b^2dx^4}{72}+\frac{b^2dx^3\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{18c}-\frac{b^2dx^2}{24c^2}+\frac{b^2dx\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{12c^3}-\frac{b^2d\operatorname{asin}^2(cx)}{24c^4} & \text{for}\ c\neq 0\\ \frac{a^2dx^4}{4} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**6/6 + a**2*d*x**4/4 - a*b*c**2*d*x**6*asin(c*x)/
3 - a*b*c*d*x**5*sqrt(-c**2*x**2 + 1)/18 + a*b*d*x**4*asin(c*x)/2 + a*b*d*x
**3*sqrt(-c**2*x**2 + 1)/(18*c) + a*b*d*x*sqrt(-c**2*x**2 + 1)/(12*c**3) -
a*b*d*asin(c*x)/(12*c**4) - b**2*c**2*d*x**6*asin(c*x)**2/6 + b**2*c**2*d*x
**6/108 - b**2*c*d*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/18 + b**2*d*x**4*asi
n(c*x)**2/4 - b**2*d*x**4/72 + b**2*d*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
18*c) - b**2*d*x**2/(24*c**2) + b**2*d*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(12
*c**3) - b**2*d*asin(c*x)**2/(24*c**4), Ne(c, 0)), (a**2*d*x**4/4, True))
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 377 vs. 2(177) = 354.
time = 0.44, size = 377, normalized size = 1.87

$$-\frac{1}{6}\,a^2c^2dx^6+\frac{1}{4}\,a^2dx^4-\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\,b^2dx\arcsin\left(cx\right)}{18\,c^3}-\frac{\left(c^2x^2-1\right)^3b^2d\arcsin\left(cx\right)^2}{6\,c^4}-\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\,abdx}{18\,c^3}+\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2dx\arcsin\left(cx\right)}{18\,c^3}-\frac{\left(c^2x^2-1\right)^3abd\arcsin\left(cx\right)}{3\,c^4}-\frac{\left(c^2x^2-1\right)^2b^2d\arcsin\left(cx\right)^2}{4\,c^4}+\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}abdx}{18\,c^3}+\frac{\sqrt{-c^2x^2+1}\,b^2dx\arcsin\left(cx\right)}{12\,c^3}+\frac{\left(c^2x^2-1\right)^3b^2d}{108\,c^4}-\frac{\left(c^2x^2-1\right)^2abd\arcsin\left(cx\right)}{2\,c^4}+\frac{\sqrt{-c^2x^2+1}\,abdx}{12\,c^3}+\frac{\left(c^2x^2-1\right)^2b^2d}{72\,c^4}+\frac{b^2d\arcsin\left(cx\right)^2}{24\,c^4}-\frac{\left(c^2x^2-1\right)b^2d}{24\,c^4}+\frac{abd\arcsin\left(cx\right)}{12\,c^4}-\frac{5\,b^2d}{216\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/6*a^2*c^2*d*x^6 + 1/4*a^2*d*x^4 - 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1
)*b^2*d*x*arcsin(c*x)/c^3 - 1/6*(c^2*x^2 - 1)^3*b^2*d*arcsin(c*x)^2/c^4 - 1
/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d*x/c^3 + 1/18*(-c^2*x^2 + 1)^(3
/2)*b^2*d*x*arcsin(c*x)/c^3 - 1/3*(c^2*x^2 - 1)^3*a*b*d*arcsin(c*x)/c^4 - 1
/4*(c^2*x^2 - 1)^2*b^2*d*arcsin(c*x)^2/c^4 + 1/18*(-c^2*x^2 + 1)^(3/2)*a*b*
d*x/c^3 + 1/12*sqrt(-c^2*x^2 + 1)*b^2*d*x*arcsin(c*x)/c^3 + 1/108*(c^2*x^2
- 1)^3*b^2*d/c^4 - 1/2*(c^2*x^2 - 1)^2*a*b*d*arcsin(c*x)/c^4 + 1/12*sqrt(-c
^2*x^2 + 1)*a*b*d*x/c^3 + 1/72*(c^2*x^2 - 1)^2*b^2*d/c^4 + 1/24*b^2*d*arcsi
n(c*x)^2/c^4 - 1/24*(c^2*x^2 - 1)*b^2*d/c^4 + 1/12*a*b*d*arcsin(c*x)/c^4 -
5/216*b^2*d/c^4
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.158 $\int x^2(d-c^2dx^2)\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=211

$$-\frac{52b^2dx}{225c^2}-\frac{26}{675}b^2dx^3+\frac{2}{125}b^2c^2dx^5+\frac{8bd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{45c^3}+\frac{4bdx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{45c}+$$

```
[Out] -52/225*b^2*d*x/c^2-26/675*b^2*d*x^3+2/125*b^2*c^2*d*x^5+2/15*b*d*(-c^2*x^2
+1)^(3/2)*(a+b*arcsin(c*x))/c^3-2/25*b*d*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x
))/c^3+2/15*d*x^3*(a+b*arcsin(c*x))^2+1/5*d*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*
x))^2+8/45*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+4/45*b*d*x^2*(a+b*a
rcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.24, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12}

$$\frac{4bdx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{45c}+\frac{1}{5}dx^3(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2-\frac{2bd(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{25c^3}+\frac{2bd(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{15c^3}+\frac{8bd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{45c^3}+\frac{2}{15}dx^3(a+b\text{ArcSin}(cx))^2+\frac{2}{125}b^2c^2dx^5-\frac{52b^2dx}{225c^2}-\frac{26}{675}b^2dx^3$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-52*b^2*d*x)/(225*c^2) - (26*b^2*d*x^3)/675 + (2*b^2*c^2*d*x^5)/125 + (8*b
*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3) + (4*b*d*x^2*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x]))/(15*c^3) - (2*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(25*c^
3) + (2*d*x^3*(a + b*ArcSin[c*x])^2)/15 + (d*x^3*(1 - c^2*x^2)*(a + b*ArcSi
n[c*x])^2)/5
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
```

```
b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{5}dx^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{5}(2d)\int x^2\left(a+b\sin^{-1}(cx)\right)^2$$

$$=\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{15c^3}-\frac{2bd\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(\right.}{25c^3}$$

$$=\frac{4bdx^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{45c}+\frac{2bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(\right.}{15c^3}$$

$$=-\frac{4b^2dx}{75c^2}-\frac{26}{675}b^2dx^3+\frac{2}{125}b^2c^2dx^5+\frac{8bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(c\right.}{45c^3}$$

$$=-\frac{52b^2dx}{225c^2}-\frac{26}{675}b^2dx^3+\frac{2}{125}b^2c^2dx^5+\frac{8bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(\right.}{45c^3}$$

Mathematica [A]
time = 0.15, size = 179, normalized size = 0.85

$$-\frac{d\left(225a^2c^3x^3(-5+3c^2x^2)+30ab\sqrt{1-c^2x^2}\,(-26-13c^2x^2+9c^4x^4)+b^2(780cx+130c^3x^3-54c^5x^5)+30b\left(15ac^3x^3(-5+3c^2x^2)+b\sqrt{1-c^2x^2}\,(-26-13c^2x^2+9c^4x^4)\right)\mathrm{ArcSin}(cx)+225b^2c^3x^3(-5+3c^2x^2)\,\mathrm{ArcSin}(cx)^2\right)}{3375c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/3375*(d*(225*a^2*c^3*x^3*(-5 + 3*c^2*x^2) + 30*a*b*Sqrt[1 - c^2*x^2]*(-2
6 - 13*c^2*x^2 + 9*c^4*x^4) + b^2*(780*c*x + 130*c^3*x^3 - 54*c^5*x^5) + 30
*b*(15*a*c^3*x^3*(-5 + 3*c^2*x^2) + b*Sqrt[1 - c^2*x^2]*(-26 - 13*c^2*x^2 +
 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*c^3*x^3*(-5 + 3*c^2*x^2)*ArcSin[c*x]^2))
/c^3
```

Maple [A]
time = 0.13, size = 280, normalized size = 1.33

method	result

derivativedivides	$\frac{-d\,a^2\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{15}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2}}{45}\right.}{}$
default	$\frac{-d\,a^2\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{15}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2}}{45}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-d*a^2*(1/5*c^5*x^5-1/3*c^3*x^3)-d*b^2*(1/3*arcsin(c*x)^2*(c^2*x^2-3
)*c*x+4/15*c*x-4/15*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/45*arcsin(c*x)*(c^2*x^
2-1)*(-c^2*x^2+1)^(1/2)-2/135*(c^2*x^2-3)*c*x+1/15*arcsin(c*x)^2*(3*c^4*x^4
-10*c^2*x^2+15)*c*x+2/25*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)-2/375
*(3*c^4*x^4-10*c^2*x^2+15)*c*x)-2*d*a*b*(1/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^
3*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-13/225*c^2*x^2*(-c^2*x^2+1)^(
1/2)-26/225*(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.50, size = 354, normalized size = 1.68

$$-\frac{1}{5}\,b^2c^2dx^5\arcsin\left(cx\right)^2-\frac{1}{5}\,a^2c^2dx^5+\frac{1}{3}\,b^2dx^3\arcsin\left(cx\right)^2-\frac{2}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^2d-\frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin\left(cx\right)-\frac{9\,c^4x^5+20\,c^2x^3+120\,x}{c^4}\right)b^2c^2d+\frac{1}{3}\,a^2dx^3+\frac{2}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abd+\frac{2}{27}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin\left(cx\right)-\frac{c^2x^3+6\,x}{c^2}\right)b^2d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/5*b^2*c^2*d*x^5*arcsin(c*x)^2 - 1/5*a^2*c^2*d*x^5 + 1/3*b^2*d*x^3*arcsin
(c*x)^2 - 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt
(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*d - 2/1125*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^2*d + 1/3*a^2*d*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2*d
```

Fricas [A]
time = 3.06, size = 194, normalized size = 0.92

$$-\frac{27\,(25\,a^2-2\,b^2)c^5dx^5-5\,(225\,a^2-26\,b^2)c^3dx^3+780\,b^2cdx+225\,(3\,b^2c^5dx^5-5\,b^2c^3dx^3)\arcsin\left(cx\right)^2+450\,(3\,abc^5dx^5-5\,abc^3dx^3)\arcsin\left(cx\right)+30\,(9\,abc^4dx^4-13\,abc^2dx^2-26\,abd+(9\,b^2c^4dx^4-13\,b^2c^2dx^2-26\,b^2d)\arcsin\left(cx\right))\sqrt{-c^2x^2+1}}{3375\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/3375*(27*(25*a^2 - 2*b^2)*c^5*d*x^5 - 5*(225*a^2 - 26*b^2)*c^3*d*x^3 + 7
80*b^2*c*d*x + 225*(3*b^2*c^5*d*x^5 - 5*b^2*c^3*d*x^3)*arcsin(c*x)^2 + 450*
```

```
(3*a*b*c^5*d*x^5 - 5*a*b*c^3*d*x^3)*arcsin(c*x) + 30*(9*a*b*c^4*d*x^4 - 13*
a*b*c^2*d*x^2 - 26*a*b*d + (9*b^2*c^4*d*x^4 - 13*b^2*c^2*d*x^2 - 26*b^2*d)*
arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A]
time = 0.60, size = 313, normalized size = 1.48

$$\begin{cases} -\frac{a^2c^2dx^5}{5} + \frac{a^2dx^3}{3} - \frac{2abc^2dx^5\operatorname{asin}(cx)}{5} - \frac{2abcdx^4\sqrt{-c^2x^2+1}}{25} + \frac{2abdx^3\operatorname{asin}(cx)}{3} + \frac{26abdx^2\sqrt{-c^2x^2+1}}{225c} + \frac{52abd\sqrt{-c^2x^2+1}}{225c^3} - \frac{b^2c^2dx^5\operatorname{asin}^2(cx)}{5} + \frac{2b^2c^2dx^5}{125} - \frac{2b^2cdx^4\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{25} + \frac{b^2dx^3\operatorname{asin}^2(cx)}{3} - \frac{26b^2dx^3}{675} + \frac{26b^2dx^2\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{225c} - \frac{52b^2dx}{225c^2} + \frac{52b^2d\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{225c^3} & \text{for } c \neq 0 \\ \frac{a^2dx^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**5/5 + a**2*d*x**3/3 - 2*a*b*c**2*d*x**5*asin(c*x
)/5 - 2*a*b*c*d*x**4*sqrt(-c**2*x**2 + 1)/25 + 2*a*b*d*x**3*asin(c*x)/3 + 2
6*a*b*d*x**2*sqrt(-c**2*x**2 + 1)/(225*c) + 52*a*b*d*sqrt(-c**2*x**2 + 1)/(
225*c**3) - b**2*c**2*d*x**5*asin(c*x)**2/5 + 2*b**2*c**2*d*x**5/125 - 2*b*
*2*c*d*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/25 + b**2*d*x**3*asin(c*x)**2/3
- 26*b**2*d*x**3/675 + 26*b**2*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*c
) - 52*b**2*d*x/(225*c**2) + 52*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*
c**3), Ne(c, 0)), (a**2*d*x**3/3, True))
```

Giac [A]
time = 0.44, size = 356, normalized size = 1.69

$$-\frac{1}{5}a^2c^2dx^5 + \frac{1}{3}a^2dx^3 - \frac{(c^2x^2-1)^2b^2dx\arcsin(cx)^2}{5c^2} - \frac{2(c^2x^2-1)^2abdx\arcsin(cx)}{5c^2} - \frac{(c^2x^2-1)b^2dx\arcsin(cx)^2}{15c^2} + \frac{2(c^2x^2-1)^2b^2dx}{125c^2} - \frac{2(c^2x^2-1)abdx\arcsin(cx)}{15c^2} + \frac{2b^2dx\arcsin(cx)^2}{15c^2} - \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,b^2d\arcsin(cx)}{25c^3} - \frac{22(c^2x^2-1)b^2dx}{3375c^2} + \frac{4abdx\arcsin(cx)}{15c^2} - \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,abd}{25c^3} + \frac{2(-c^2x^2+1)^{\frac{3}{2}}b^2d\arcsin(cx)}{45c^3} - \frac{856b^2dx}{3375c^2} + \frac{2(-c^2x^2+1)^{\frac{3}{2}}abd}{45c^3} + \frac{4\sqrt{-c^2x^2+1}\,b^2d\arcsin(cx)}{15c^3} + \frac{4\sqrt{-c^2x^2+1}\,abd}{15c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/5*a^2*c^2*d*x^5 + 1/3*a^2*d*x^3 - 1/5*(c^2*x^2 - 1)^2*b^2*d*x*arcsin(c*x
)^2/c^2 - 2/5*(c^2*x^2 - 1)^2*a*b*d*x*arcsin(c*x)/c^2 - 1/15*(c^2*x^2 - 1)*
b^2*d*x*arcsin(c*x)^2/c^2 + 2/125*(c^2*x^2 - 1)^2*b^2*d*x/c^2 - 2/15*(c^2*x
^2 - 1)*a*b*d*x*arcsin(c*x)/c^2 + 2/15*b^2*d*x*arcsin(c*x)^2/c^2 - 2/25*(c^
2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^3 - 22/3375*(c^2*x^2 -
1)*b^2*d*x/c^2 + 4/15*a*b*d*x*arcsin(c*x)/c^2 - 2/25*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*a*b*d/c^3 + 2/45*(-c^2*x^2 + 1)^(3/2)*b^2*d*arcsin(c*x)/c^3 -
856/3375*b^2*d*x/c^2 + 2/45*(-c^2*x^2 + 1)^(3/2)*a*b*d/c^3 + 4/15*sqrt(-c^2
*x^2 + 1)*b^2*d*arcsin(c*x)/c^3 + 4/15*sqrt(-c^2*x^2 + 1)*a*b*d/c^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\left(d-c^2\,d\,x^2\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.159 $\int x(d-c^2dx^2)(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=138

$$-\frac{5}{32}b^2dx^2+\frac{1}{32}b^2c^2dx^4+\frac{3bdx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{16c}+\frac{bdx(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{8c}+\frac{3d(a+b\text{A}}{3}$$

```
[Out] -5/32*b^2*d*x^2+1/32*b^2*c^2*d*x^4+1/8*b*d*x*(-c^2*x^2+1)^(3/2)*(a+b*arcsin
(c*x))/c+3/32*d*(a+b*arcsin(c*x))^2/c^2-1/4*d*(-c^2*x^2+1)^2*(a+b*arcsin(c*
x))^2/c^2+3/16*b*d*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.10, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}=0.261$, Rules used = {4767, 4743, 4741, 4737, 30, 14}

$$\frac{bdx(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{8c}+\frac{3bdx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{16c}-\frac{d(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))^2}{4c^2}+\frac{3d(a+b\text{ArcSin}(cx))^2}{32c^2}+\frac{1}{32}b^2c^2dx^4-\frac{5}{32}b^2dx^2$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-5*b^2*d*x^2)/32 + (b^2*c^2*d*x^4)/32 + (3*b*d*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(16*c) + (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*c
) + (3*d*(a + b*ArcSin[c*x])^2)/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/(4*c^2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int x\left(d-c^2dx^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx &= -\frac{d(1-c^2x^2)^2\left(a+b\sin^{-1}(cx)\right)^2}{4c^2}+\frac{(bd)\int(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(\right.}{2c}\\ &= \frac{bdx(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{8c}-\frac{d(1-c^2x^2)^2\left(a+b\sin^{-1}(cx)\right)^2}{4c^2}\\ &= \frac{3bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{16c}+\frac{bdx(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx\right.}{8c}\\ &= -\frac{5}{32}b^2dx^2+\frac{1}{32}b^2c^2dx^4+\frac{3bdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{16c}+\frac{bdx(}{}\end{aligned}$$

Mathematica [A]
time = 0.17, size = 157, normalized size = 1.14

$$-\frac{d\left(cx\left(b^2cx(5-c^2x^2)+8a^2cx(-2+c^2x^2)+2ab\sqrt{1-c^2x^2}\,(-5+2c^2x^2)\right)+2b\left(bcx\sqrt{1-c^2x^2}\,(-5+2c^2x^2)+a(5-16c^2x^2+8c^4x^4)\right)\mathrm{ArcSin}(cx)+b^2(5-16c^2x^2+8c^4x^4)\,\mathrm{ArcSin}(cx)^2\right)}{32c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/32*(d*(c*x*(b^2*c*x*(5 - c^2*x^2) + 8*a^2*c*x*(-2 + c^2*x^2) + 2*a*b*Sqr
t[1 - c^2*x^2]*(-5 + 2*c^2*x^2)) + 2*b*(b*c*x*Sqrt[1 - c^2*x^2]*(-5 + 2*c^2
*x^2) + a*(5 - 16*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + b^2*(5 - 16*c^2*x^2 +
 8*c^4*x^4)*ArcSin[c*x]^2))/c^2
```

Maple [A]
time = 0.12, size = 192, normalized size = 1.39

method	result
derivativedivides	$\frac{-\frac{d\left(c^2x^2-1\right)^2a^2}{4}-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^2}{4}-\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}+5cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}\right.}{}$
default	$\frac{-\frac{d\left(c^2x^2-1\right)^2a^2}{4}-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^2}{4}-\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}+5cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/4*d*(c^2*x^2-1)^2*a^2-d*b^2*(1/4*arcsin(c*x)^2*(c^2*x^2-1)^2-1/16
*arcsin(c*x)*(-2*c^3*x^3*(-c^2*x^2+1)^(1/2)+5*c*x*(-c^2*x^2+1)^(1/2)+3*arcs
in(c*x))+3/32*arcsin(c*x)^2-1/128*(2*c^2*x^2-5)^2)-2*d*a*b*(1/4*c^4*x^4*arc
sin(c*x)-1/2*c^2*x^2*arcsin(c*x)+5/32*arcsin(c*x)+1/16*c^3*x^3*(-c^2*x^2+1)
^(1/2)-5/32*c*x*(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*c^2*d*x^4 - 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^
2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*c^2*d + 1/2*a^2*
d*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/
c^3))*a*b*d - 1/4*(b^2*c^2*d*x^4 - 2*b^2*d*x^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 - integrate(1/2*(b^2*c^3*d*x^4 - 2*b^2*c*d*x^2)*sqrt(c*x
+ 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1
), x)
```

Fricas [A]
time = 2.76, size = 176, normalized size = 1.28

$$-\frac{(8\,a^2-b^2)c^4dx^4-(16\,a^2-5\,b^2)c^2dx^2+(8\,b^2c^4dx^4-16\,b^2c^2dx^2+5\,b^2d)\arcsin(cx)^2+2\,(8\,abc^4dx^4-16\,abc^2dx^2+5\,abd)\arcsin(cx)+2\,(2\,abc^3dx^3-5\,abcdx+(2\,b^2c^3dx^3-5\,b^2cdx)\arcsin(cx))\sqrt{-c^2x^2+1}}{32\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/32*((8*a^2 - b^2)*c^4*d*x^4 - (16*a^2 - 5*b^2)*c^2*d*x^2 + (8*b^2*c^4*d*
x^4 - 16*b^2*c^2*d*x^2 + 5*b^2*d)*arcsin(c*x)^2 + 2*(8*a*b*c^4*d*x^4 - 16*a
*b*c^2*d*x^2 + 5*a*b*d)*arcsin(c*x) + 2*(2*a*b*c^3*d*x^3 - 5*a*b*c*d*x + (2
*b^2*c^3*d*x^3 - 5*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 269 vs. $2(129) = 258$.
time = 0.41, size = 269, normalized size = 1.95

$$\begin{cases} -\frac{a^2c^2dx^4}{4} + \frac{a^2dx^2}{2} - \frac{abc^2dx^4\operatorname{asin}(cx)}{2} - \frac{abcdx^3\sqrt{-c^2x^2+1}}{8} + abdx^2\operatorname{asin}(cx) + \frac{5abdx\sqrt{-c^2x^2+1}}{16c} - \frac{5abd\operatorname{asin}(cx)}{16c^2} - \frac{b^2c^2dx^4\operatorname{asin}^2(cx)}{4} + \frac{b^2c^2dx^4}{32} - \frac{b^2cdx^3\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{8} + \frac{b^2dx^2\operatorname{asin}^2(cx)}{2} - \frac{5b^2dx^2}{32} + \frac{5b^2dx\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{16c} - \frac{5b^2d\operatorname{asin}^2(cx)}{32c^2} & \text{for } c \neq 0 \\ \frac{a^2dx^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**4/4 + a**2*d*x**2/2 - a*b*c**2*d*x**4*asin(c*x)/
2 - a*b*c*d*x**3*sqrt(-c**2*x**2 + 1)/8 + a*b*d*x**2*asin(c*x) + 5*a*b*d*x*
sqrt(-c**2*x**2 + 1)/(16*c) - 5*a*b*d*asin(c*x)/(16*c**2) - b**2*c**2*d*x**
4*asin(c*x)**2/4 + b**2*c**2*d*x**4/32 - b**2*c*d*x**3*sqrt(-c**2*x**2 + 1)
*asin(c*x)/8 + b**2*d*x**2*asin(c*x)**2/2 - 5*b**2*d*x**2/32 + 5*b**2*d*x*s
qrt(-c**2*x**2 + 1)*asin(c*x)/(16*c) - 5*b**2*d*asin(c*x)**2/(32*c**2), Ne(
c, 0)), (a**2*d*x**2/2, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 248 vs. $2(121) = 242$.
time = 0.45, size = 248, normalized size = 1.80

$$-\frac{1}{4}a^2c^2dx^4 + \frac{(-c^2x^2+1)^{\frac{3}{2}}b^2dx\arcsin(cx)}{8c} - \frac{(c^2x^2-1)^2b^2d\arcsin(cx)^2}{4c^2} + \frac{(-c^2x^2+1)^{\frac{3}{2}}abdx}{8c} + \frac{3\sqrt{-c^2x^2+1}\,b^2dx\arcsin(cx)}{16c} - \frac{(c^2x^2-1)^2abd\arcsin(cx)}{2c^2} + \frac{3\sqrt{-c^2x^2+1}\,abdx}{16c} + \frac{(c^2x^2-1)^2b^2d}{32c^2} + \frac{3b^2d\arcsin(cx)^2}{32c^2} + \frac{(c^2x^2-1)a^2d}{2c^2} - \frac{3(c^2x^2-1)b^2d}{32c^2} + \frac{3abd\arcsin(cx)}{16c^2} - \frac{15b^2d}{256c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/4*a^2*c^2*d*x^4 + 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*d*x*arcsin(c*x)/c - 1/4*(
c^2*x^2 - 1)^2*b^2*d*arcsin(c*x)^2/c^2 + 1/8*(-c^2*x^2 + 1)^(3/2)*a*b*d*x/c
 + 3/16*sqrt(-c^2*x^2 + 1)*b^2*d*x*arcsin(c*x)/c - 1/2*(c^2*x^2 - 1)^2*a*b*
d*arcsin(c*x)/c^2 + 3/16*sqrt(-c^2*x^2 + 1)*a*b*d*x/c + 1/32*(c^2*x^2 - 1)^
2*b^2*d/c^2 + 3/32*b^2*d*arcsin(c*x)^2/c^2 + 1/2*(c^2*x^2 - 1)*a^2*d/c^2 -
3/32*(c^2*x^2 - 1)*b^2*d/c^2 + 3/16*a*b*d*arcsin(c*x)/c^2 - 15/256*b^2*d/c^
2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.160 $\int (d - c^2 d x^2) (a + b\mathbf{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=128

$$-\frac{14}{9}b^2dx+\frac{2}{27}b^2c^2dx^3+\frac{4bd\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{3c}+\frac{2bd(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))}{9c}+\frac{2}{3}dx(a+b\mathrm{ArcS}$$

```
[Out] -14/9*b^2*d*x+2/27*b^2*c^2*d*x^3+2/9*b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x
))/c+2/3*d*x*(a+b*arcsin(c*x))^2+1/3*d*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+4
/3*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.10, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4743, 4715, 4767, 8}

$$\frac{1}{3}dx\left(1-c^2x^2\right)(a+b\mathrm{ArcSin}(cx))^2+\frac{2bd(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))}{9c}+\frac{4bd\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{3c}+\frac{2}{3}dx(a+b\mathrm{ArcSin}(cx))^2+\frac{2}{27}b^2c^2dx^3-\frac{14}{9}b^2dx$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-14*b^2*d*x)/9 + (2*b^2*c^2*d*x^3)/27 + (4*b*d*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(3*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(9*c) +
 (2*d*x*(a + b*ArcSin[c*x])^2)/3 + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int (d-c^2dx^2)\left(a+b\sin^{-1}(cx)\right)^2\,dx &= \frac{1}{3}dx(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}(2d)\int\left(a+b\sin^{-1}(cx)\right)^2\,dx\\ &= \frac{2bd(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{9c}+\frac{2}{3}dx\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}dx(\\ &= -\frac{2}{9}b^2dx+\frac{2}{27}b^2c^2dx^3+\frac{4bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{2bd(1-\\ &= -\frac{14}{9}b^2dx+\frac{2}{27}b^2c^2dx^3+\frac{4bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{3c}+\frac{2bd(1-\end{aligned}$$

Mathematica [A]
time = 0.15, size = 137, normalized size = 1.07

$$-\frac{d\left(-2b^2cx(-21+c^2x^2)+6ab\sqrt{1-c^2x^2}(-7+c^2x^2)+9a^2cx(-3+c^2x^2)+6b\left(b\sqrt{1-c^2x^2}(-7+c^2x^2)+3acx(-3+c^2x^2)\right)\text{ArcSin}(cx)+9b^2cx(-3+c^2x^2)\text{ArcSin}(cx)^2\right)}{27c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/27*(d*(-2*b^2*c*x*(-21 + c^2*x^2) + 6*a*b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^
2) + 9*a^2*c*x*(-3 + c^2*x^2) + 6*b*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3
*a*c*x*(-3 + c^2*x^2))*ArcSin[c*x] + 9*b^2*c*x*(-3 + c^2*x^2)*ArcSin[c*x]^2
))/c
```

Maple [A]
time = 0.04, size = 173, normalized size = 1.35

method	result
derivativedivides	$\frac{-d\,a^2\left(\frac{1}{3}c^3x^3-cx\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{3}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{3}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2}}{9}\right.}{c}$
default	$\frac{-d\,a^2\left(\frac{1}{3}c^3x^3-cx\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{3}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{3}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2}}{9}\right.}{c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-d*a^2*(1/3*c^3*x^3-c*x)-d*b^2*(1/3*arcsin(c*x)^2*(c^2*x^2-3)*c*x+4/3*
c*x-4/3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/9*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)-2/27*(c^2*x^2-3)*c*x)-2*d*a*b*(1/3*c^3*x^3*arcsin(c*x)-c*x*arcsi
n(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-7/9*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 233 vs. $2(111) = 222$.
time = 0.49, size = 233, normalized size = 1.82

$$-\frac{1}{3}\,b^{2}c^{2}dx^{3}\arcsin\left(cx\right)^{2}-\frac{1}{3}\,a^{2}c^{2}dx^{3}-\frac{2}{9}\left(3\,x^{3}\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^{2}x^{2}+1}\,x^{2}}{c^{2}}+\frac{2\,\sqrt{-c^{2}x^{2}+1}}{c^{4}}\right)\right)abc^{2}d-\frac{2}{27}\left(3\,c\left(\frac{\sqrt{-c^{2}x^{2}+1}\,x^{2}}{c^{2}}+\frac{2\,\sqrt{-c^{2}x^{2}+1}}{c^{4}}\right)\arcsin\left(cx\right)-\frac{c^{2}x^{3}+6\,x}{c^{2}}\right)b^{2}c^{2}d+b^{2}dx\arcsin\left(cx\right)^{2}-2\,b^{2}d\left(x-\frac{\sqrt{-c^{2}x^{2}+1}\arcsin\left(cx\right)}{c}\right)+a^{2}dx+\frac{2\left(cx\arcsin\left(cx\right)+\sqrt{-c^{2}x^{2}+1}\right)abd}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/3*b^2*c^2*d*x^3*arcsin(c*x)^2 - 1/3*a^2*c^2*d*x^3 - 2/9*(3*x^3*arcsin(c*
x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d -
 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c
*x) - (c^2*x^3 + 6*x)/c^2)*b^2*c^2*d + b^2*d*x*arcsin(c*x)^2 - 2*b^2*d*(x -
 sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*x + 2*(c*x*arcsin(c*x) + sqrt(-c
^2*x^2 + 1))*a*b*d/c
```

Fricas [A]
time = 3.99, size = 146, normalized size = 1.14

$$-\frac{\left(9\,a^{2}-2\,b^{2}\right)c^{3}dx^{3}-3\left(9\,a^{2}-14\,b^{2}\right)cdx+9\left(b^{2}c^{3}dx^{3}-3\,b^{2}cdx\right)\arcsin\left(cx\right)^{2}+18\left(abc^{3}dx^{3}-3\,abcdx\right)\arcsin\left(cx\right)+6\left(abc^{2}dx^{2}-7\,abd+\left(b^{2}c^{2}dx^{2}-7\,b^{2}d\right)\arcsin\left(cx\right)\right)\sqrt{-c^{2}x^{2}+1}}{27\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/27*((9*a^2 - 2*b^2)*c^3*d*x^3 - 3*(9*a^2 - 14*b^2)*c*d*x + 9*(b^2*c^3*d*
x^3 - 3*b^2*c*d*x)*arcsin(c*x)^2 + 18*(a*b*c^3*d*x^3 - 3*a*b*c*d*x)*arcsin(
c*x) + 6*(a*b*c^2*d*x^2 - 7*a*b*d + (b^2*c^2*d*x^2 - 7*b^2*d)*arcsin(c*x))*
sqrt(-c^2*x^2 + 1))/c
```

Sympy [A]
time = 0.31, size = 224, normalized size = 1.75

$$\begin{cases} -\frac{a^{2}c^{2}dx^{3}}{3}+a^{2}dx-\frac{2abc^{2}dx^{3}\operatorname{asin}\left(cx\right)}{3}-\frac{2abcdx^{2}\sqrt{-c^{2}x^{2}+1}}{9}+2abdx\operatorname{asin}\left(cx\right)+\frac{14abd\sqrt{-c^{2}x^{2}+1}}{9c}-\frac{b^{2}c^{2}dx^{3}\operatorname{asin}^{2}\left(cx\right)}{3}+\frac{2b^{2}c^{2}dx^{3}}{27}-\frac{2b^{2}cdx^{2}\sqrt{-c^{2}x^{2}+1}\operatorname{asin}\left(cx\right)}{9}+b^{2}dx\operatorname{asin}^{2}\left(cx\right)-\frac{14b^{2}dx}{9}+\frac{14b^{2}d\sqrt{-c^{2}x^{2}+1}\operatorname{asin}\left(cx\right)}{9c} & \text{for}\: c\neq 0 \\ a^{2}dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**3/3 + a**2*d*x - 2*a*b*c**2*d*x**3*asin(c*x)/3 -
 2*a*b*c*d*x**2*sqrt(-c**2*x**2 + 1)/9 + 2*a*b*d*x*asin(c*x) + 14*a*b*d*sqr
t(-c**2*x**2 + 1)/(9*c) - b**2*c**2*d*x**3*asin(c*x)**2/3 + 2*b**2*c**2*d*x
**3/27 - 2*b**2*c*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/9 + b**2*d*x*asin(c
*x)**2 - 14*b**2*d*x/9 + 14*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c), Ne
(c, 0)), (a**2*d*x, True))
```

Giac [A]
time = 0.45, size = 196, normalized size = 1.53

$$-\frac{1}{3}\,a^2c^2dx^3-\frac{1}{3}\,(c^2x^2-1)b^2dx\arcsin\left(cx\right)^2-\frac{2}{3}\,(c^2x^2-1)abdx\arcsin\left(cx\right)+\frac{2}{3}\,b^2dx\arcsin\left(cx\right)^2+\frac{2}{27}\,(c^2x^2-1)b^2dx+\frac{4}{3}\,abdx\arcsin\left(cx\right)+\frac{2\,(-c^2x^2+1)^{\frac{3}{2}}b^2d\arcsin\left(cx\right)}{9\,c}+a^2dx-\frac{40}{27}\,b^2dx+\frac{2\,(-c^2x^2+1)^{\frac{3}{2}}abd}{9\,c}+\frac{4\,\sqrt{-c^2x^2+1}\,b^2d\arcsin\left(cx\right)}{3\,c}+\frac{4\,\sqrt{-c^2x^2+1}\,abd}{3\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/3*a^2*c^2*d*x^3 - 1/3*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*x)^2 - 2/3*(c^2*x^2
 - 1)*a*b*d*x*arcsin(c*x) + 2/3*b^2*d*x*arcsin(c*x)^2 + 2/27*(c^2*x^2 - 1)*
b^2*d*x + 4/3*a*b*d*x*arcsin(c*x) + 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*d*arcsin(c
*x)/c + a^2*d*x - 40/27*b^2*d*x + 2/9*(-c^2*x^2 + 1)^(3/2)*a*b*d/c + 4/3*sq
rt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c + 4/3*sqrt(-c^2*x^2 + 1)*a*b*d/c
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\left(d-c^2\,d\,x^2\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.161 $\int \frac{(d-c^2dx^2)(a+b\text{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=178

$$\frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{1}{4}d(a+b\text{ArcSin}(cx))^2+\frac{1}{2}d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2-\frac{id(a}{}$$

```
[Out] 1/4*b^2*c^2*d*x^2-1/4*d*(a+b*arcsin(c*x))^2+1/2*d*(-c^2*x^2+1)*(a+b*arcsin(
c*x))^2-1/3*I*d*(a+b*arcsin(c*x))^3/b+d*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)-I*b*d*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(
1/2))^2)+1/2*b^2*d*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d*x*(a+b
*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30}

$$\frac{1}{2}d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-ibd\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{id(a+b\text{ArcSin}(cx))^3}{3b}-\frac{1}{4}d(a+b\text{ArcSin}(cx))^2+d\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2+\frac{1}{2}b^2d\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)+\frac{1}{4}b^2c^2dx^2$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (b^2*c^2*d*x^2)/4 - (b*c*d*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 - (d*
(a + b*ArcSin[c*x])^2)/4 + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 - ((I/
3)*d*(a + b*ArcSin[c*x])^3)/b + d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Ar
cSin[c*x])] - I*b*d*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] +
 (b^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
```

```
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx=\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2+d\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx-(bcd)$$

$$=-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{2}d\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right.$$

$$=\frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)$$

$$=\frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)$$

$$=\frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)$$

$$=\frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)$$

$$=\frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{4}d\left(a+b\sin^{-1}(cx)\right)$$

Mathematica [A]
time = 0.30, size = 256, normalized size = 1.44

$$\frac{1}{2}d\left(-a^2c^2x^2-2abc^2x^2\text{ArcSin}(cx)-ab\left(cx\sqrt{1-c^2x^2}-2\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)+\frac{1}{4}b^2\left(-1+2\text{ArcSin}(cx)^2\right)\cos(2\text{ArcSin}(cx))+4ab\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+2a^2\log(x)-2iab\left(\text{ArcSin}(cx)^2+\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)+\frac{1}{12}b^2\left(-i\pi^3+8i\text{ArcSin}(cx)^3+24\text{ArcSin}(cx)^2\log\left(1-e^{-2i\text{ArcSin}(cx)}\right)+24i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(cx)}\right)+12\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(cx)}\right)\right)-\frac{1}{2}b^2\text{ArcSin}(cx)\sin(2\text{ArcSin}(cx))\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d*(-(a^2*c^2*x^2) - 2*a*b*c^2*x^2*ArcSin[c*x] - a*b*(c*x*Sqrt[1 - c^2*x^2]
 - 2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]) + (b^2*(-1 + 2*ArcSin[c*x]^2)*
Cos[2*ArcSin[c*x]])/4 + 4*a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] +
2*a^2*Log[x] - (2*I)*a*b*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])]
) + (b^2*((-I)*Pi^3 + (8*I)*ArcSin[c*x]^3 + 24*ArcSin[c*x]^2*Log[1 - E^((-2
```

```
*I)*ArcSin[c*x])] + (24*I)*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] +
 12*PolyLog[3, E^((-2*I)*ArcSin[c*x])]))/12 - (b^2*ArcSin[c*x]*Sin[2*ArcSin
[c*x]])/2))/2
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 420 vs. $2(192) = 384$.
time = 0.28, size = 421, normalized size = 2.37

method	result
derivativedivides	$-\frac{d a^2 c^2 x^2}{2} + d a^2 \ln(cx) - \frac{i d b^2 \arcsin(cx)^3}{3} + d b^2 \arcsin(cx)^2 \ln\left(1 - icx - \sqrt{-c^2x^2+1}\right) -$
default	$-\frac{d a^2 c^2 x^2}{2} + d a^2 \ln(cx) - \frac{i d b^2 \arcsin(cx)^3}{3} + d b^2 \arcsin(cx)^2 \ln\left(1 - icx - \sqrt{-c^2x^2+1}\right) -$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*d*a^2*c^2*x^2+d*a^2*ln(c*x)-1/3*I*d*b^2*arcsin(c*x)^3+d*b^2*arcsin(c*x
)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*d*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^
(1/2))+2*d*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+d*b^2*arcsin(c*x)^2*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*d*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*
d*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+1/4*d*b^2*arcsin(c*x)^2*cos(2*ar
csin(c*x))-1/8*d*b^2*cos(2*arcsin(c*x))-1/4*d*b^2*arcsin(c*x)*sin(2*arcsin(
c*x))-2*I*d*b^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*d*a*b*ar
csin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*d*a*b*arcsin(c*x)*ln(1-I*c*x-(-c
^2*x^2+1)^(1/2))-2*I*d*b^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-
I*d*a*b*arcsin(c*x)^2+1/2*d*a*b*arcsin(c*x)*cos(2*arcsin(c*x))-1/4*d*a*b*si
n(2*arcsin(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*c^2*d*x^2 + a^2*d*log(x) - integrate(((b^2*c^2*d*x^2 - b^2*d)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")

[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x, x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{a^2}{x}\right)dx+\int a^2c^2x\,dx+\int\left(-\frac{b^2\operatorname{asin}^2(cx)}{x}\right)dx+\int\left(-\frac{2ab\operatorname{asin}(cx)}{x}\right)dx+\int b^2c^2x\operatorname{asin}^2(cx)\,dx+\int 2abc^2x\operatorname{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x,x)

[Out] -d*(Integral(-a**2/x, x) + Integral(a**2*c**2*x, x) + Integral(-b**2*asin(c*x)**2/x, x) + Integral(-2*a*b*asin(c*x)/x, x) + Integral(b**2*c**2*x*asin(c*x)**2, x) + Integral(2*a*b*c**2*x*asin(c*x), x))

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")

[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x, x)

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\left(d-c^2\,d\,x^2\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x,x)

[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x, x)

3.162 $\int \frac{(d-c^2dx^2)(a+b\mathbf{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=149

$$2b^2c^2dx-2bcd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-2c^2dx(a+b\text{ArcSin}(cx))^2-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{x}-4bcd$$

```
[Out] 2*b^2*c^2*d*x-2*c^2*d*x*(a+b*arcsin(c*x))^2-d*(-c^2*x^2+1)*(a+b*arcsin(c*x)
)^2/x-4*b*c*d*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*c
*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*c*d*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))-2*b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {4785, 4715, 4767, 8, 4783, 4803, 4268, 2317, 2438}

$$-2bcd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{x}-2c^2dx(a+b\text{ArcSin}(cx))^2-4bcd\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))+2ib^2cd\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)-2ib^2cd\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)+2b^2c^2dx$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] 2*b^2*c^2*d*x - 2*b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - 2*c^2*d*x*(
a + b*ArcSin[c*x])^2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/x - 4*b*c*d*
(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d*PolyLog[2, -
E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)\,(a+b\sin^{-1}(cx))^2}{x^2}\,dx = -\frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{x} + (2bcd)\int \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(\ldots}{x}$$

$$= 2bcd\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d(1-\ldots}{}$$

$$= -2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(c\ldots\right.$$

$$= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\ldots\right.$$

$$= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\ldots\right.$$

$$= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right) - 2c^2dx\left(a+b\sin^{-1}(cx)\ldots\right.$$

Mathematica [A]
time = 0.31, size = 203, normalized size = 1.36

$$-\frac{d\left(a^2+a^2c^2x^2+2abcx\left(\sqrt{1-c^2x^2}+cx\text{ArcSin}(cx)\right)+b^2cx\left(2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+cx(-2+\text{ArcSin}(cx)^2)\right)+2ab\left(\text{ArcSin}(cx)+cx\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)\right)-ib^2(i\text{ArcSin}(cx)\,(\text{ArcSin}(cx)+2cx(-\log(1-e^{i\text{ArcSin}(cx)})+\log(1+e^{i\text{ArcSin}(cx)})))+2cx\text{PolyLog}(2,-e^{i\text{ArcSin}(cx)})-2cx\text{PolyLog}(2,e^{i\text{ArcSin}(cx)}))\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((d*(a^2 + a^2*c^2*x^2 + 2*a*b*c*x*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) +
 b^2*c*x*(2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + c*x*(-2 + ArcSin[c*x]^2)) + 2*a
*b*(ArcSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]) - I*b^2*(I*ArcSin[c*x]*(A
rcSin[c*x] + 2*c*x*(-Log[1 - E^(I*ArcSin[c*x])] + Log[1 + E^(I*ArcSin[c*x])
])) + 2*c*x*PolyLog[2, -E^(I*ArcSin[c*x])] - 2*c*x*PolyLog[2, E^(I*ArcSin[c
*x])]))))/x)
```

Maple [A]
time = 0.31, size = 250, normalized size = 1.68

method	result
derivativedivides	$c\Big(-d\,a^2\left(cx+\frac{1}{cx}\right)-2d\,b^2\arcsin(cx)\sqrt{-c^2x^2+1}-d\,b^2\arcsin(cx)^2\,cx+2d\,b^2cx-\frac{d\ldots}{}$
default	$c\Big(-d\,a^2\left(cx+\frac{1}{cx}\right)-2d\,b^2\arcsin(cx)\sqrt{-c^2x^2+1}-d\,b^2\arcsin(cx)^2\,cx+2d\,b^2cx-\frac{d\ldots}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-d*a^2*(c*x+1/c/x)-2*d*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-d*b^2*arcsin(c
*x)^2*c*x+2*d*b^2*c*x-d*b^2/c/x*arcsin(c*x)^2+2*d*b^2*arcsin(c*x)*ln(1-I*c*
x-(-c^2*x^2+1)^(1/2))-2*d*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*
I*d*b^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*d*b^2*polylog(2,-I*c*x-(-c^
2*x^2+1)^(1/2))-2*d*a*b*(c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/
2)+arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] -b^2*c^2*d*x*arcsin(c*x)^2 + 2*b^2*c^2*d*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x
)/c) - a^2*c^2*d*x - 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d - 2*(
c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d - (2*c
*x*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1))/(c^2*x^3 - x), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)
*b^2*d/x - a^2*d/x
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int a^{2}c^{2}\,dx + \int\left(-\frac{a^{2}}{x^{2}}\right)dx + \int b^{2}c^{2}\operatorname{asin}^{2}{\left(cx \right)}\,dx + \int\left(-\frac{b^{2}\operatorname{asin}^{2}{\left(cx \right)}}{x^{2}}\right)dx + \int 2abc^{2}\operatorname{asin}{\left(cx \right)}\,dx + \int\left(-\frac{2ab\operatorname{asin}{\left(cx \right)}}{x^{2}}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] -d*(Integral(a**2*c**2, x) + Integral(-a**2/x**2, x) + Integral(b**2*c**2*a
sin(c*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**2, x) + Integral(2*a*b*c**
2*asin(c*x), x) + Integral(-2*a*b*asin(c*x)/x**2, x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\left(d-c^2\,d\,x^2\right)}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^2,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^2, x)
```

3.163 $\int \frac{(d-c^2dx^2)(a+b\mathbf{ArcSin}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=193

$$-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{x}-\frac{1}{2}c^2d(a+b\text{ArcSin}(cx))^2-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{2x^2}+\frac{ic^2d(a+b\text{Arc}}{3b}$$

```
[Out] -1/2*c^2*d*(a+b*arcsin(c*x))^2-1/2*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/x^2+1
/3*I*c^2*d*(a+b*arcsin(c*x))^3/b-c^2*d*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)+b^2*c^2*d*ln(x)+I*b*c^2*d*(a+b*arcsin(c*x))*polylog(2,(I
*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2*c^2*d*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/
2))^2)-b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/x
```

Rubi [A]
time = 0.20, antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4785, 4721, 3798, 2221, 2611, 2320, 6724, 4781, 29, 4737}

$$ibc^2d\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{2x^2}-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{x}+\frac{ic^2d(a+b\text{ArcSin}(cx))^3}{3b}-\frac{1}{2}c^2d(a+b\text{ArcSin}(cx))^2-c^2d\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2-\frac{1}{2}b^2c^2d\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)+b^2c^2d\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/x) - (c^2*d*(a + b*ArcSin[c
*x])^2)/2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + ((I/3)*c^2*d*
(a + b*ArcSin[c*x])^3)/b - c^2*d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Arc
Sin[c*x])] + b^2*c^2*d*Log[x] + I*b*c^2*d*(a + b*ArcSin[c*x])*PolyLog[2, E^
((2*I)*ArcSin[c*x])] - (b^2*c^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
```

```
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx = -\frac{d(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} + (bcd)\int \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx}{x^2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x} - \frac{d(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} -$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x} - \frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d(1-c}{}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x} - \frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d(1-c}{}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x} - \frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d(1-c}{}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x} - \frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d(1-c}{}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x} - \frac{1}{2}c^2d\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d(1-c}{}$$

Mathematica [A]
time = 0.26, size = 236, normalized size = 1.22

$$\frac{1}{2}d\left(-\frac{a^2}{x^2}-\frac{2ab\left(cx\sqrt{1-c^2x^2}+\text{ArcSin}(cx)\right)}{x^2}-2a^2c^2\log(x)-\frac{b^2\left(2cx\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+\text{ArcSin}(cx)^2-2c^2x^2\log(cx)\right)}{x^2}+2iabc^2\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\log\left(1-e^{2i\text{ArcSin}(cx)}\right)\right)+\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)+\frac{1}{12}ib^2c^2\left(\pi^3-8\text{ArcSin}(cx)^3+24i\text{ArcSin}(cx)^2\log\left(1-e^{-2i\text{ArcSin}(cx)}\right)-24\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(cx)}\right)+12i\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(cx)}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d*(-(a^2/x^2) - (2*a*b*(c*x*Sqrt[1 - c^2*x^2] + ArcSin[c*x]))/x^2 - 2*a^2*
c^2*Log[x] - (b^2*(2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 2*
c^2*x^2*Log[c*x]))/x^2 + (2*I)*a*b*c^2*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*Lo
g[1 - E^((2*I)*ArcSin[c*x])]) + PolyLog[2, E^((2*I)*ArcSin[c*x])]) + (I/12)
*b^2*c^2*(Pi^3 - 8*ArcSin[c*x]^3 + (24*I)*ArcSin[c*x]^2*Log[1 - E^((-2*I)*A
```

```
rcSin[c*x])] - 24*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (12*I)*P
olyLog[3, E^((-2*I)*ArcSin[c*x])])))/2
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 526 vs. $2(211) = 422$.
time = 0.47, size = 527, normalized size = 2.73

method	result
derivativedivides	$c^2\left(-\frac{d\,a^2}{2c^2x^2} - d\,a^2\ln(cx) + \frac{id\,b^2\arcsin(cx)^3}{3} + id\,b^2\arcsin(cx) - \frac{d\,b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{cx} -\right.$
default	$c^2\left(-\frac{d\,a^2}{2c^2x^2} - d\,a^2\ln(cx) + \frac{id\,b^2\arcsin(cx)^3}{3} + id\,b^2\arcsin(cx) - \frac{d\,b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{cx} -\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/2*d*a^2/c^2/x^2-d*a^2*ln(c*x)+1/3*I*d*b^2*arcsin(c*x)^3+I*d*b^2*arc
sin(c*x)-d*b^2*arcsin(c*x)/c/x*(-c^2*x^2+1)^(1/2)-1/2*d*b^2*arcsin(c*x)^2/c
^2/x^2-d*b^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*d*a*b-2*d*b^2*p
olylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-d*b^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2
+1)^(1/2))+2*I*d*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*d*b^2*polylog(3
,-I*c*x-(-c^2*x^2+1)^(1/2))+d*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-2*d*b^2*ln
(I*c*x+(-c^2*x^2+1)^(1/2))+d*b^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*d*a*b*p
olylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*d*b^2*arcsin(c*x)*polylog(2,-I*c*x-(
-c^2*x^2+1)^(1/2))-d*a*b/c/x*(-c^2*x^2+1)^(1/2)-d*a*b*arcsin(c*x)/c^2/x^2-2
*d*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*d*a*b*arcsin(c*x)*ln(1+
I*c*x+(-c^2*x^2+1)^(1/2))+I*d*a*b*arcsin(c*x)^2+2*I*d*b^2*arcsin(c*x)*polyl
og(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] -a^2*c^2*d*log(x) - a*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*
a^2*d/x^2 - integrate((2*a*b*c^2*d*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + (b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
^2)/x^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{a^2}{x^3}\right)dx+\int\frac{a^2c^2}{x}\,dx+\int\left(-\frac{b^2\operatorname{asin}^2(cx)}{x^3}\right)dx+\int\left(-\frac{2ab\operatorname{asin}(cx)}{x^3}\right)dx+\int\frac{b^2c^2\operatorname{asin}^2(cx)}{x}\,dx+\int\frac{2abc^2\operatorname{asin}(cx)}{x}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] -d*(Integral(-a**2/x**3, x) + Integral(a**2*c**2/x, x) + Integral(-b**2*asi
n(c*x)**2/x**3, x) + Integral(-2*a*b*asin(c*x)/x**3, x) + Integral(b**2*c**
2*asin(c*x)**2/x, x) + Integral(2*a*b*c**2*asin(c*x)/x, x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{(a+b\operatorname{asin}(c\,x))^2\,(d-c^2\,d\,x^2)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^3, x)
```

3.164 $\int \frac{(d-c^2dx^2)(a+b\textbf{ArcSin}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=176

$$-\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3x^2}+\frac{2c^2d(a+b\text{ArcSin}(cx))^2}{3x}-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{3x^3}+\frac{10}{3}b$$

```
[Out] -1/3*b^2*c^2*d/x+2/3*c^2*d*(a+b*arcsin(c*x))^2/x-1/3*d*(-c^2*x^2+1)*(a+b*ar
csin(c*x))^2/x^3+10/3*b*c^3*d*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^
(1/2))-5/3*I*b^2*c^3*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+5/3*I*b^2*c^3*d
*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/3*b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+
1)^(1/2)/x^2
```

Rubi [A]
time = 0.27, antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {4785, 4723, 4803, 4268, 2317, 2438, 4781, 30}

$$\frac{10}{3}bc^3d\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3x^2}-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{3x^3}+\frac{2c^2d(a+b\text{ArcSin}(cx))^2}{3x}-\frac{5}{3}ib^2c^3d\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)+\frac{5}{3}ib^2c^3d\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)-\frac{b^2c^2d}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d)/x - (b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*x^2)
+ (2*c^2*d*(a + b*ArcSin[c*x])^2)/(3*x) - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*
x])^2)/(3*x^3) + (10*b*c^3*d*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])]
)/3 - ((5*I)/3)*b^2*c^3*d*PolyLog[2, -E^(I*ArcSin[c*x])] + ((5*I)/3)*b^2*c^
3*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\int \frac{(d-c^2dx^2)\,(a+b\sin^{-1}(cx))^2}{x^4}\,dx &= -\frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{3x^3}+\frac{1}{3}(2bcd)\int \frac{\sqrt{1-c^2x^2}\,(a+b\sin^-}{x^3} \\
&= -\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2}+\frac{2c^2d(a+b\sin^{-1}(cx))^2}{3x}-\frac{d(1-}{} \\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2}+\frac{2c^2d(a+b\sin^{-1}(cx))^2}{3x} \\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2}+\frac{2c^2d(a+b\sin^{-1}(cx))^2}{3x} \\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2}+\frac{2c^2d(a+b\sin^{-1}(cx))^2}{3x} \\
&= -\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2}+\frac{2c^2d(a+b\sin^{-1}(cx))^2}{3x}
\end{aligned}
$$

Mathematica [A]
time = 0.53, size = 266, normalized size = 1.51

$$
\frac{d\left(-a^2+3a^2c^2x^2-b^2c^2x^2-abcx\sqrt{1-c^2x^2}-2ab\mathrm{ArcSin}(cx)+6abc^2x^2\mathrm{ArcSin}(cx)-b^2cx\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)-b^2\mathrm{ArcSin}(cx)^2+3b^2c^2x^2\mathrm{ArcSin}(cx)^2+5abc^3x^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-5b^2c^3x^3\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)+5b^2c^3x^3\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)-5ib^2c^3x^3\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)+5ib^2c^3x^3\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{3x^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d*(-a^2 + 3*a^2*c^2*x^2 - b^2*c^2*x^2 - a*b*c*x*Sqrt[1 - c^2*x^2] - 2*a*b*
ArcSin[c*x] + 6*a*b*c^2*x^2*ArcSin[c*x] - b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[
c*x] - b^2*ArcSin[c*x]^2 + 3*b^2*c^2*x^2*ArcSin[c*x]^2 + 5*a*b*c^3*x^3*ArcT
anh[Sqrt[1 - c^2*x^2]] - 5*b^2*c^3*x^3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x]
)] + 5*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (5*I)*b^2*c^3*x
^3*PolyLog[2, -E^(I*ArcSin[c*x])] + (5*I)*b^2*c^3*x^3*PolyLog[2, E^(I*ArcSi
n[c*x])]))/(3*x^3)
```

Maple [A]
time = 0.57, size = 287, normalized size = 1.63

method	result
derivativedivides	$c^3\left(-d\,a^2\left(\frac{1}{3c^3x^3}-\frac{1}{cx}\right)+\frac{d\,b^2\arcsin(cx)^2}{cx}-\frac{d\,b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{3c^2x^2}-\frac{d\,b^2\arcsin(cx)^2}{3c^3x^3}-\frac{d\,b^2}{3cx}-\right.$

default	$c^3\left(-d\,a^2\left(\frac{1}{3c^3x^3}-\frac{1}{cx}\right)+\frac{d\,b^2\arcsin(cx)^2}{cx}-\frac{d\,b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{3c^2x^2}-\frac{d\,b^2\arcsin(cx)^2}{3c^3x^3}-\frac{d\,b^2}{3cx}-\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-d*a^2*(1/3/c^3/x^3-1/c/x)+d*b^2/c/x*arcsin(c*x)^2-1/3*d*b^2/c^2/x^2*a
rcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/3*d*b^2/c^3/x^3*arcsin(c*x)^2-1/3*d*b^2/c/x
-5/3*d*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+5/3*I*d*b^2*polylog(2
,I*c*x+(-c^2*x^2+1)^(1/2))+5/3*d*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))-5/3*I*d*b^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*d*a*b*(1/3/c^3/x^3*
arcsin(c*x)-1/c/x*arcsin(c*x)+1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)-5/6*arctanh(1/
(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] 2*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*c^2*d
 - 1/3*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 +
1)/x^2)*c + 2*arcsin(c*x)/x^3)*a*b*d + a^2*c^2*d/x - 1/3*a^2*d/x^3 + 1/3*(3
*x^3*integrate(2/3*(3*b^2*c^3*d*x^2 - b^2*c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 - x^3), x) + (3*b^2*c^
2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/x^3
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^4, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{a^2}{x^4}\right)dx+\int\frac{a^2c^2}{x^2}\,dx+\int\left(-\frac{b^2\operatorname{asin}^2(cx)}{x^4}\right)dx+\int\left(-\frac{2ab\operatorname{asin}(cx)}{x^4}\right)dx+\int\frac{b^2c^2\operatorname{asin}^2(cx)}{x^2}\,dx+\int\frac{2abc^2\operatorname{asin}(cx)}{x^2}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] -d*(Integral(-a**2/x**4, x) + Integral(a**2*c**2/x**2, x) + Integral(-b**2*
asin(c*x)**2/x**4, x) + Integral(-2*a*b*asin(c*x)/x**4, x) + Integral(b**2*
c**2*asin(c*x)**2/x**2, x) + Integral(2*a*b*c**2*asin(c*x)/x**2, x))
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^4, x)
```

3.165 $\int x^4(d-c^2dx^2)^2 (a+b\textbf{ArcSin}(cx))^2 dx$

Optimal. Leaf size=395

$$-\frac{4208b^2d^2x}{99225c^4}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c^4d^2x^9+\frac{128bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{4725c^5}+\frac{6}{}$$

```
[Out] -4208/99225*b^2*d^2*x/c^4-2104/297675*b^2*d^2*x^3/c^2-526/165375*b^2*d^2*x^
5+212/27783*b^2*c^2*d^2*x^7-2/729*b^2*c^4*d^2*x^9+8/189*b*d^2*(-c^2*x^2+1)^
(3/2)*(a+b*arcsin(c*x))/c^5-2/315*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x)
)/c^5-20/441*b*d^2*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c*x))/c^5+2/81*b*d^2*(-c^
2*x^2+1)^(9/2)*(a+b*arcsin(c*x))/c^5+8/315*d^2*x^5*(a+b*arcsin(c*x))^2+4/63
*d^2*x^5*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/9*d^2*x^5*(-c^2*x^2+1)^2*(a+b*a
rcsin(c*x))^2+128/4725*b*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+64/47
25*b*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/1575*b*d^2*x^4*(a+
b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.50, antiderivative size = 395, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 1167}

$$\frac{1}{9}d^2x^5(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2+\frac{4}{63}d^2x^5(1-c^2x^2)(a+b\text{ArcSin}(cx))^2+\frac{16bd^2x^4\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{1575c}+\frac{2bd^2(1-c^2x^2)^{9/2}(a+b\text{ArcSin}(cx))}{81c^5}-\frac{20bd^2(1-c^2x^2)^{7/2}(a+b\text{ArcSin}(cx))}{441c^5}-\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{315c^5}+\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{189c^5}+\frac{128bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{4725c^5}+\frac{64bd^2x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{4725c^3}+\frac{8}{315}d^2x^5(a+b\text{ArcSin}(cx))^2-\frac{2}{729}b^2c^4d^2x^9-\frac{4208b^2d^2x}{99225c^4}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-4208*b^2*d^2*x)/(99225*c^4) - (2104*b^2*d^2*x^3)/(297675*c^2) - (526*b^2*
d^2*x^5)/165375 + (212*b^2*c^2*d^2*x^7)/27783 - (2*b^2*c^4*d^2*x^9)/729 + (
128*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^5) + (64*b*d^2*x^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^3) + (16*b*d^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(1575*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a +
 b*ArcSin[c*x]))/(189*c^5) - (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(315*c^5) - (20*b*d^2*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(441*c^5
) + (2*b*d^2*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^5) + (8*d^2*x^5
*(a + b*ArcSin[c*x])^2)/315 + (4*d^2*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^
2)/63 + (d^2*x^5*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/9
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
```

```
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{9}d^2x^5\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{9}(4d)\int x^4\left(d-c^2dx^2\right)\left(a\right.$$

$$=\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{45c^5}-\frac{4bd^2\left(1-c^2x^2\right)^{7/2}\left(a+b\sin\right.}{63c^5}$$

$$=\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{189c^5}-\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin\right.}{315c^5}$$

$$=\frac{16bd^2x^4\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{1575c}+\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.}{189c^5}$$

$$=-\frac{304b^2d^2x}{19845c^4}-\frac{152b^2d^2x^3}{59535c^2}-\frac{526b^2d^2x^5}{165375}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c^4d^2$$

$$=-\frac{304b^2d^2x}{19845c^4}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c^4$$

$$=-\frac{4208b^2d^2x}{99225c^4}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c$$

Mathematica [A]
time = 0.15, size = 253, normalized size = 0.64

$$\frac{d^2\left(99225a^2c^5x^5(63-90c^2x^2+35c^4x^4)+630ab\sqrt{1-c^2x^2}\,(2104+1052c^2x^2+789c^4x^4-2650c^6x^6+1225c^8x^8)-2b^2cx(662760+110460c^2x^2+49707c^4x^4-119250c^6x^6+42875c^8x^8)+630b\left(315ac^5x^5(63-90c^2x^2+35c^4x^4)+b\sqrt{1-c^2x^2}\,(2104+1052c^2x^2+789c^4x^4-2650c^6x^6+1225c^8x^8)\right)\mathrm{ArcSin}(cx)+99225b^2c^5x^5(63-90c^2x^2+35c^4x^4)\,\mathrm{ArcSin}(cx)^2\right)}{31255875c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(99225*a^2*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + 630*a*b*Sqrt[1 - c
^2*x^2]*(2104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^8) -
 2*b^2*c*x*(662760 + 110460*c^2*x^2 + 49707*c^4*x^4 - 119250*c^6*x^6 + 4287
5*c^8*x^8) + 630*b*(315*a*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + b*Sqrt[1
 - c^2*x^2]*(2104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^
8))*ArcSin[c*x] + 99225*b^2*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4)*ArcSin[c
*x]^2))/(31255875*c^5)
```

Maple [A]
time = 0.20, size = 531, normalized size = 1.34

method	result
derivativedivides	$d^2a^2\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{525}-\frac{2\left(3c^4\right.}{}\right.$
default	$d^2a^2\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{525}-\frac{2\left(3c^4\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(d^2*a^2*(1/9*c^9*x^9-2/7*c^7*x^7+1/5*c^5*x^5)+d^2*b^2*(1/15*arcsin(c
*x)^2*(3*c^4*x^4-10*c^2*x^2+15)*c*x+2/525*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x
^2+1)^(1/2)-2/7875*(3*c^4*x^4-10*c^2*x^2+15)*c*x-8/945*arcsin(c*x)*(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)+8/2835*(c^2*x^2-3)*c*x-16/315*c*x+16/315*arcsin(c*x)
*(-c^2*x^2+1)^(1/2)+2/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)
*c*x+20/441*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-4/3087*(5*c^6*x^6-
21*c^4*x^4+35*c^2*x^2-35)*c*x+1/315*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^6+3
78*c^4*x^4-420*c^2*x^2+315)*c*x+2/81*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)
^(1/2)-2/25515*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x)+2*
d^2*a*b*(1/9*arcsin(c*x)*c^9*x^9-2/7*arcsin(c*x)*c^7*x^7+1/5*arcsin(c*x)*c^
5*x^5+1/81*c^8*x^8*(-c^2*x^2+1)^(1/2)-106/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+2
63/33075*c^4*x^4*(-c^2*x^2+1)^(1/2)+1052/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)+2
104/99225*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 781 vs. 2(349) = 698.

time = 0.53, size = 781, normalized size = 1.98

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/9*b^2*c^4*d^2*x^9*arcsin(c*x)^2 + 1/9*a^2*c^4*d^2*x^9 - 2/7*b^2*c^2*d^2*x
^7*arcsin(c*x)^2 - 2/7*a^2*c^2*d^2*x^7 + 1/5*b^2*d^2*x^5*arcsin(c*x)^2 + 2/
2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x
^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2
/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*a*b*c^4*d^2 + 2/893025*(315*(35*sqrt
(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 +
 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*
c*arcsin(c*x) - (1225*c^8*x^9 + 1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2*x^3
+ 40320*x)/c^8)*b^2*c^4*d^2 + 1/5*a^2*d^2*x^5 - 4/245*(35*x^7*arcsin(c*x) +
 (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2
*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^2*d^2 - 4/25725*(10
5*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^
2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7
 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^2*d^2 + 2/75*(15*x^5*arcs
in(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*
sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d^2 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c
^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x)
 - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*d^2
```

Fricas [A]
time = 2.11, size = 337, normalized size = 0.85

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/31255875*(42875*(81*a^2 - 2*b^2)*c^9*d^2*x^9 - 2250*(3969*a^2 - 106*b^2)*
c^7*d^2*x^7 + 189*(33075*a^2 - 526*b^2)*c^5*d^2*x^5 - 220920*b^2*c^3*d^2*x^
3 - 1325520*b^2*c*d^2*x + 99225*(35*b^2*c^9*d^2*x^9 - 90*b^2*c^7*d^2*x^7 +
63*b^2*c^5*d^2*x^5)*arcsin(c*x)^2 + 198450*(35*a*b*c^9*d^2*x^9 - 90*a*b*c^7
*d^2*x^7 + 63*a*b*c^5*d^2*x^5)*arcsin(c*x) + 630*(1225*a*b*c^8*d^2*x^8 - 26
50*a*b*c^6*d^2*x^6 + 789*a*b*c^4*d^2*x^4 + 1052*a*b*c^2*d^2*x^2 + 2104*a*b*
d^2 + (1225*b^2*c^8*d^2*x^8 - 2650*b^2*c^6*d^2*x^6 + 789*b^2*c^4*d^2*x^4 +
1052*b^2*c^2*d^2*x^2 + 2104*b^2*d^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 2.24, size = 563, normalized size = 1.43

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**9/9 - 2*a**2*c**2*d**2*x**7/7 + a**2*d**2*x**5
/5 + 2*a*b*c**4*d**2*x**9*asin(c*x)/9 + 2*a*b*c**3*d**2*x**8*sqrt(-c**2*x**
2 + 1)/81 - 4*a*b*c**2*d**2*x**7*asin(c*x)/7 - 212*a*b*c*d**2*x**6*sqrt(-c*
*2*x**2 + 1)/3969 + 2*a*b*d**2*x**5*asin(c*x)/5 + 526*a*b*d**2*x**4*sqrt(-c
**2*x**2 + 1)/(33075*c) + 2104*a*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(99225*c*
*3) + 4208*a*b*d**2*sqrt(-c**2*x**2 + 1)/(99225*c**5) + b**2*c**4*d**2*x**9
*asin(c*x)**2/9 - 2*b**2*c**4*d**2*x**9/729 + 2*b**2*c**3*d**2*x**8*sqrt(-c
**2*x**2 + 1)*asin(c*x)/81 - 2*b**2*c**2*d**2*x**7*asin(c*x)**2/7 + 212*b**
2*c**2*d**2*x**7/27783 - 212*b**2*c*d**2*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x
)/3969 + b**2*d**2*x**5*asin(c*x)**2/5 - 526*b**2*d**2*x**5/165375 + 526*b*
*2*d**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(33075*c) - 2104*b**2*d**2*x**3
/(297675*c**2) + 2104*b**2*d**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(99225*
c**3) - 4208*b**2*d**2*x/(99225*c**4) + 4208*b**2*d**2*sqrt(-c**2*x**2 + 1)
*asin(c*x)/(99225*c**5), Ne(c, 0)), (a**2*d**2*x**5/5, True))
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 702 vs. 2(349) = 698.
time = 0.45, size = 702, normalized size = 1.78

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/9*a^2*c^4*d^2*x^9 - 2/7*a^2*c^2*d^2*x^7 + 1/5*a^2*d^2*x^5 + 1/9*(c^2*x^2
- 1)^4*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/9*(c^2*x^2 - 1)^4*a*b*d^2*x*arcsin(c
*x)/c^4 + 10/63*(c^2*x^2 - 1)^3*b^2*d^2*x*arcsin(c*x)^2/c^4 - 2/729*(c^2*x^
2 - 1)^4*b^2*d^2*x/c^4 + 20/63*(c^2*x^2 - 1)^3*a*b*d^2*x*arcsin(c*x)/c^4 +
1/105*(c^2*x^2 - 1)^2*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/81*(c^2*x^2 - 1)^4*sq
rt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 - 836/250047*(c^2*x^2 - 1)^3*b^2*d
^2*x/c^4 + 2/105*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x)/c^4 - 4/315*(c^2*x^2
 - 1)*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)
*a*b*d^2/c^5 + 20/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x
)/c^5 + 33862/10418625*(c^2*x^2 - 1)^2*b^2*d^2*x/c^4 - 8/315*(c^2*x^2 - 1)*
a*b*d^2*x*arcsin(c*x)/c^4 + 8/315*b^2*d^2*x*arcsin(c*x)^2/c^4 + 20/441*(c^2
*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^5 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^
2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 - 47248/31255875*(c^2*x^2 - 1)*b^2*d^2*x
/c^4 + 16/315*a*b*d^2*x*arcsin(c*x)/c^4 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x
^2 + 1)*a*b*d^2/c^5 + 8/945*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*arcsin(c*x)/c^5 -
1493104/31255875*b^2*d^2*x/c^4 + 8/945*(-c^2*x^2 + 1)^(3/2)*a*b*d^2/c^5 + 1
6/315*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 + 16/315*sqrt(-c^2*x^2 + 1
)*a*b*d^2/c^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^4 (a + b \operatorname{asin}(c x))^2 \left(d - c^2 d x^2\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.166 $\int x^3(d-c^2dx^2)^2 (a+b\mathbf{ArcSin}(cx))^2 dx$

Optimal. Leaf size=302

$$-\frac{73b^2d^2x^2}{3072c^2}-\frac{73b^2d^2x^4}{9216}+\frac{43b^2c^2d^2x^6}{3456}-\frac{1}{256}b^2c^4d^2x^8+\frac{73bd^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{1536c^3}+\frac{73bd^2x^3\sqrt{1-c^2x}}{2}$$

```
[Out] -73/3072*b^2*d^2*x^2/c^2-73/9216*b^2*d^2*x^4+43/3456*b^2*c^2*d^2*x^6-1/256*
b^2*c^4*d^2*x^8-1/32*b*c*d^2*x^5*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-73/30
72*d^2*(a+b*arcsin(c*x))^2/c^4+1/24*d^2*x^4*(a+b*arcsin(c*x))^2+1/12*d^2*x^
4*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/8*d^2*x^4*(-c^2*x^2+1)^2*(a+b*arcsin(c
*x))^2+73/1536*b*d^2*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+73/2304*b*d
^2*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c-25/576*b*c*d^2*x^5*(a+b*arcsi
n(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.69, antiderivative size = 302, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4787, 4723, 4795, 4737, 30, 4783, 14}

$$-\frac{73d^2(a+b\text{ArcSin}(cx))^2}{3072c^4}-\frac{1}{32}bcd^2x^5(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))-\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{8}d^2x^4(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2+\frac{1}{12}d^2x^4(1-c^2x^2)(a+b\text{ArcSin}(cx))^2+\frac{73bd^2x^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2304c}+\frac{73bd^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{1536c^3}+\frac{1}{24}d^2x^4(a+b\text{ArcSin}(cx))^2-\frac{1}{256}b^2c^4d^2x^8+\frac{43b^2c^2d^2x^6}{3456}-\frac{73b^2d^2x^2}{3072c^2}-\frac{73b^2d^2x^4}{9216}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-73*b^2*d^2*x^2)/(3072*c^2) - (73*b^2*d^2*x^4)/9216 + (43*b^2*c^2*d^2*x^6)
/3456 - (b^2*c^4*d^2*x^8)/256 + (73*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(1536*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(
2304*c) - (25*b*c*d^2*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/576 - (b*c
*d^2*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/32 - (73*d^2*(a + b*ArcSi
n[c*x])^2)/(3072*c^4) + (d^2*x^4*(a + b*ArcSin[c*x])^2)/24 + (d^2*x^4*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/12 + (d^2*x^4*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/8
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^3 (d - c^2 d x^2)^2 \left(a + b \sin^{-1}(cx)\right)^2 \, dx = \frac{1}{8} d^2 x^4 (1 - c^2 x^2)^2 \left(a + b \sin^{-1}(cx)\right)^2 + \frac{1}{2} d \int x^3 (d - c^2 d x^2) \left(a + \right.$$

$$= -\frac{1}{32} bcd^2 x^5 (1 - c^2 x^2)^{3/2} \left(a + b \sin^{-1}(cx)\right) + \frac{1}{12} d^2 x^4 (1 - c^2 x^2) \left(\right.$$

$$= -\frac{25}{576} bcd^2 x^5 \sqrt{1 - c^2 x^2} \left(a + b \sin^{-1}(cx)\right) - \frac{1}{32} bcd^2 x^5 (1 - c^2 x^2)^3$$

$$= \frac{43 b^2 c^2 d^2 x^6}{3456} - \frac{1}{256} b^2 c^4 d^2 x^8 + \frac{73 b d^2 x^3 \sqrt{1 - c^2 x^2} \left(a + b \sin^{-1}(cx)\right.}{2304 c}$$

$$= -\frac{73 b^2 d^2 x^4}{9216} + \frac{43 b^2 c^2 d^2 x^6}{3456} - \frac{1}{256} b^2 c^4 d^2 x^8 + \frac{73 b d^2 x \sqrt{1 - c^2 x^2} \left(a\right.}{1536 c^3}$$

$$= -\frac{73 b^2 d^2 x^2}{3072 c^2} - \frac{73 b^2 d^2 x^4}{9216} + \frac{43 b^2 c^2 d^2 x^6}{3456} - \frac{1}{256} b^2 c^4 d^2 x^8 + \frac{73 b d^2 x \sqrt{}}{}$$

Mathematica [A]
time = 0.15, size = 239, normalized size = 0.79

$$\frac{d^2 \left(cx \left(1152 a^2 c^3 x^3 (6 - 8 c^2 x^2 + 3 c^4 x^4) - b^2 cx (657 + 219 c^2 x^2 - 344 c^4 x^4 + 108 c^6 x^6) + 6 a b \sqrt{1 - c^2 x^2} (219 + 146 c^2 x^2 - 344 c^4 x^4 + 144 c^6 x^6)\right) + 6 b \left(bcx \sqrt{1 - c^2 x^2} (219 + 146 c^2 x^2 - 344 c^4 x^4 + 144 c^6 x^6) + 3 a (-73 + 768 c^4 x^4 - 1024 c^6 x^6 + 384 c^8 x^8)\right) \text{ArcSin}(cx) + 9 b^2 (-73 + 768 c^4 x^4 - 1024 c^6 x^6 + 384 c^8 x^8) \text{ArcSin}(cx)^2\right)}{27648 c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(c*x*(1152*a^2*c^3*x^3*(6 - 8*c^2*x^2 + 3*c^4*x^4) - b^2*c*x*(657 + 21
9*c^2*x^2 - 344*c^4*x^4 + 108*c^6*x^6) + 6*a*b*Sqrt[1 - c^2*x^2]*(219 + 146
*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6)) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(219
+ 146*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6) + 3*a*(-73 + 768*c^4*x^4 - 1024*
c^6*x^6 + 384*c^8*x^8))*ArcSin[c*x] + 9*b^2*(-73 + 768*c^4*x^4 - 1024*c^6*x
^6 + 384*c^8*x^8)*ArcSin[c*x]^2))/(27648*c^4)
```

Maple [A]
time = 0.18, size = 424, normalized size = 1.40

method	result
derivativedivides	$\frac{d^2 a^2 \left(\frac{1}{8} c^8 x^8 - \frac{1}{3} c^6 x^6 + \frac{1}{4} c^4 x^4\right) + d^2 b^2 \left(\frac{\arcsin(cx)^2 (c^2 x^2 - 1)^3}{6} + \frac{\arcsin(cx) \left(8 c^5 x^5 \sqrt{-c^2 x^2 + 1} - 26 c^3 x^3 \sqrt{-c^2 x^2 +}\right.}{144}\right.}{}$
default	$\frac{d^2 a^2 \left(\frac{1}{8} c^8 x^8 - \frac{1}{3} c^6 x^6 + \frac{1}{4} c^4 x^4\right) + d^2 b^2 \left(\frac{\arcsin(cx)^2 (c^2 x^2 - 1)^3}{6} + \frac{\arcsin(cx) \left(8 c^5 x^5 \sqrt{-c^2 x^2 + 1} - 26 c^3 x^3 \sqrt{-c^2 x^2 +}\right.}{144}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(d^2*a^2*(1/8*c^8*x^8-1/3*c^6*x^6+1/4*c^4*x^4)+d^2*b^2*(1/6*arcsin(c*
x)^2*(c^2*x^2-1)^3+1/144*arcsin(c*x)*(8*c^5*x^5*(-c^2*x^2+1)^(1/2)-26*c^3*x
^3*(-c^2*x^2+1)^(1/2)+33*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-55/3072*arc
sin(c*x)^2-11/3456*(c^2*x^2-1)^3+55/9216*(c^2*x^2-1)^2-55/3072*c^2*x^2+55/3
072+1/8*arcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x
^2+1)^(1/2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+2
79*c*x*(-c^2*x^2+1)^(1/2)+105*arcsin(c*x))-1/256*(c^2*x^2-1)^4)+2*d^2*a*b*(
1/8*arcsin(c*x)*c^8*x^8-1/3*arcsin(c*x)*c^6*x^6+1/4*c^4*x^4*arcsin(c*x)+1/6
4*c^7*x^7*(-c^2*x^2+1)^(1/2)-43/1152*c^5*x^5*(-c^2*x^2+1)^(1/2)+73/4608*c^3
*x^3*(-c^2*x^2+1)^(1/2)+73/3072*c*x*(-c^2*x^2+1)^(1/2)-73/3072*arcsin(c*x))
)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/8*a^2*c^4*d^2*x^8 - 1/3*a^2*c^2*d^2*x^6 + 1/1536*(384*x^8*arcsin(c*x) + (
48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^
2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)
*a*b*c^4*d^2 + 1/4*a^2*d^2*x^4 - 1/72*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^
2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^
6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^2*d^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(
-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*
a*b*d^2 + 1/24*(3*b^2*c^4*d^2*x^8 - 8*b^2*c^2*d^2*x^6 + 6*b^2*d^2*x^4)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(1/12*(3*b^2*c^5*d^2*x^
8 - 8*b^2*c^3*d^2*x^6 + 6*b^2*c*d^2*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Fricas [A]
time = 2.34, size = 319, normalized size = 1.06

$$\frac{108\,(32\,a^2-b^2)c^8d^2x^8-8\,(1152\,a^2-43\,b^2)c^6d^2x^6+3\,(2304\,a^2-73\,b^2)c^4d^2x^4-657\,b^2c^2d^2x^2+9\,(384\,b^2c^8d^2x^8-1024\,b^2c^6d^2x^6+768\,b^2c^4d^2x^4-73\,b^2d^2)\arcsin(cx)^2+18\,(384\,abc^8d^2x^8-1024\,abc^6d^2x^6+768\,abc^4d^2x^4-73\,abd^2)\arcsin(cx)+6\,(144\,abc^7d^2x^7-344\,abc^5d^2x^5+146\,abc^3d^2x^3+219\,abcd^2x+(144\,b^2c^7d^2x^7-344\,b^2c^5d^2x^5+146\,b^2c^3d^2x^3+219\,b^2cd^2x)\arcsin(cx))\sqrt{-c^2x^2+1}}{27648\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27648*(108*(32*a^2 - b^2)*c^8*d^2*x^8 - 8*(1152*a^2 - 43*b^2)*c^6*d^2*x^6
 + 3*(2304*a^2 - 73*b^2)*c^4*d^2*x^4 - 657*b^2*c^2*d^2*x^2 + 9*(384*b^2*c^8
*d^2*x^8 - 1024*b^2*c^6*d^2*x^6 + 768*b^2*c^4*d^2*x^4 - 73*b^2*d^2)*arcsin(
c*x)^2 + 18*(384*a*b*c^8*d^2*x^8 - 1024*a*b*c^6*d^2*x^6 + 768*a*b*c^4*d^2*x
^4 - 73*a*b*d^2)*arcsin(c*x) + 6*(144*a*b*c^7*d^2*x^7 - 344*a*b*c^5*d^2*x^5
 + 146*a*b*c^3*d^2*x^3 + 219*a*b*c*d^2*x + (144*b^2*c^7*d^2*x^7 - 344*b^2*c
^5*d^2*x^5 + 146*b^2*c^3*d^2*x^3 + 219*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*
x^2 + 1))/c^4
```

Sympy [**A**]
time = 1.75, size = 515, normalized size = 1.71

$$\begin{cases} \frac{a^{2}c^{4}d^{2}x^{8}}{8} - \frac{a^{2}c^{2}d^{2}x^{6}}{3} + \frac{a^{2}d^{2}x^{4}}{4} + \frac{abc^{4}d^{2}x^{8}\operatorname{asin}{(cx)}}{4} + \frac{abc^{3}d^{2}x^{7}\sqrt{-c^{2}x^{2}+1}}{32} - \frac{2abc^{2}d^{2}x^{6}\operatorname{asin}{(cx)}}{3} - \frac{43abcd^{2}x^{5}\sqrt{-c^{2}x^{2}+1}}{576} + \frac{abd^{2}x^{4}\operatorname{asin}{(cx)}}{2} + \frac{73abd^{2}x^{3}\sqrt{-c^{2}x^{2}+1}}{2304c} + \frac{73abd^{2}x\sqrt{-c^{2}x^{2}+1}}{1536c^{3}} - \frac{73abd^{2}\operatorname{asin}{(cx)}}{1536c^{4}} + \frac{b^{2}c^{4}d^{2}x^{8}\operatorname{asin}^{2}{(cx)}}{8} - \frac{b^{2}c^{4}d^{2}x^{8}}{256} + \frac{b^{2}c^{3}d^{2}x^{7}\sqrt{-c^{2}x^{2}+1}\operatorname{asin}{(cx)}}{32} - \frac{b^{2}c^{2}d^{2}x^{6}\operatorname{asin}^{2}{(cx)}}{3} + \frac{43b^{2}c^{2}d^{2}x^{6}}{3456} - \frac{43b^{2}cd^{2}x^{5}\sqrt{-c^{2}x^{2}+1}\operatorname{asin}{(cx)}}{576} + \frac{b^{2}d^{2}x^{4}\operatorname{asin}^{2}{(cx)}}{4} - \frac{73b^{2}d^{2}x^{4}}{9216} + \frac{73b^{2}d^{2}x^{3}\sqrt{-c^{2}x^{2}+1}\operatorname{asin}{(cx)}}{2304c} - \frac{73b^{2}d^{2}x^{2}}{3072c^{2}} + \frac{73b^{2}d^{2}x\sqrt{-c^{2}x^{2}+1}\operatorname{asin}{(cx)}}{1536c^{3}} - \frac{73b^{2}d^{2}\operatorname{asin}^{2}{(cx)}}{3072c^{4}} & \text{for}\: c \neq 0 \\ \frac{a^{2}d^{2}x^{4}}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**8/8 - a**2*c**2*d**2*x**6/3 + a**2*d**2*x**4/4
 + a*b*c**4*d**2*x**8*asin(c*x)/4 + a*b*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)
/32 - 2*a*b*c**2*d**2*x**6*asin(c*x)/3 - 43*a*b*c*d**2*x**5*sqrt(-c**2*x**2
 + 1)/576 + a*b*d**2*x**4*asin(c*x)/2 + 73*a*b*d**2*x**3*sqrt(-c**2*x**2 +
1)/(2304*c) + 73*a*b*d**2*x*sqrt(-c**2*x**2 + 1)/(1536*c**3) - 73*a*b*d**2*
asin(c*x)/(1536*c**4) + b**2*c**4*d**2*x**8*asin(c*x)**2/8 - b**2*c**4*d**2
*x**8/256 + b**2*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)*asin(c*x)/32 - b**2*c*
*2*d**2*x**6*asin(c*x)**2/3 + 43*b**2*c**2*d**2*x**6/3456 - 43*b**2*c*d**2*
x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/576 + b**2*d**2*x**4*asin(c*x)**2/4 - 7
3*b**2*d**2*x**4/9216 + 73*b**2*d**2*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2
304*c) - 73*b**2*d**2*x**2/(3072*c**2) + 73*b**2*d**2*x*sqrt(-c**2*x**2 + 1
)*asin(c*x)/(1536*c**3) - 73*b**2*d**2*asin(c*x)**2/(3072*c**4), Ne(c, 0)),
 (a**2*d**2*x**4/4, True))
```

Giac [**A**]
time = 0.44, size = 522, normalized size = 1.73

$$\frac{1}{8}a^{2}c^{4}d^{2}x^{8} - \frac{1}{3}a^{2}c^{2}d^{2}x^{6} + \frac{1}{4}a^{2}d^{2}x^{4} + \frac{(c^{2}x^{2}-1)^{3}\sqrt{-c^{2}x^{2}+1}\,b^{2}d^{2}x\arcsin(cx)}{32\,c^{3}} + \frac{(c^{2}x^{2}-1)^{4}b^{2}d^{2}\arcsin(cx)^{2}}{8\,c^{4}} + \frac{(c^{2}x^{2}-1)^{3}\sqrt{-c^{2}x^{2}+1}\,abd^{2}x}{32\,c^{3}} + \frac{11\,(c^{2}x^{2}-1)^{2}\sqrt{-c^{2}x^{2}+1}\,b^{2}d^{2}x\arcsin(cx)}{576\,c^{3}} + \frac{(c^{2}x^{2}-1)^{4}abd^{2}\arcsin(cx)}{4\,c^{4}} + \frac{(c^{2}x^{2}-1)^{3}b^{2}d^{2}\arcsin(cx)^{2}}{6\,c^{4}} + \frac{11\,(c^{2}x^{2}-1)^{2}\sqrt{-c^{2}x^{2}+1}\,abd^{2}x}{576\,c^{3}} + \frac{55\,(-c^{2}x^{2}+1)^{\frac{3}{2}}b^{2}d^{2}x\arcsin(cx)}{2304\,c^{3}} - \frac{(c^{2}x^{2}-1)^{4}b^{2}d^{2}}{256\,c^{4}} + \frac{(c^{2}x^{2}-1)^{3}abd^{2}\arcsin(cx)}{3\,c^{4}} + \frac{55\,(-c^{2}x^{2}+1)^{\frac{3}{2}}abd^{2}x}{2304\,c^{3}} + \frac{55\,\sqrt{-c^{2}x^{2}+1}\,b^{2}d^{2}x\arcsin(cx)}{1536\,c^{3}} - \frac{11\,(c^{2}x^{2}-1)^{3}b^{2}d^{2}}{3456\,c^{4}} + \frac{55\,\sqrt{-c^{2}x^{2}+1}\,abd^{2}x}{1536\,c^{3}} + \frac{55\,(c^{2}x^{2}-1)^{2}b^{2}d^{2}}{9216\,c^{4}} + \frac{55\,b^{2}d^{2}\arcsin(cx)^{2}}{3072\,c^{4}} - \frac{55\,(c^{2}x^{2}-1)b^{2}d^{2}}{3072\,c^{4}} + \frac{55\,abd^{2}\arcsin(cx)}{1536\,c^{4}} - \frac{9835\,b^{2}d^{2}}{884736\,c^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/8*a^2*c^4*d^2*x^8 - 1/3*a^2*c^2*d^2*x^6 + 1/4*a^2*d^2*x^4 + 1/32*(c^2*x^2
 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c^3 + 1/8*(c^2*x^2 - 1)^4*
b^2*d^2*arcsin(c*x)^2/c^4 + 1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2
*x/c^3 + 11/576*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c^
3 + 1/4*(c^2*x^2 - 1)^4*a*b*d^2*arcsin(c*x)/c^4 + 1/6*(c^2*x^2 - 1)^3*b^2*d
^2*arcsin(c*x)^2/c^4 + 11/576*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^2*x/
c^3 + 55/2304*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*x*arcsin(c*x)/c^3 - 1/256*(c^2*x
```

```
^2 - 1)^4*b^2*d^2/c^4 + 1/3*(c^2*x^2 - 1)^3*a*b*d^2*arcsin(c*x)/c^4 + 55/23
04*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*x/c^3 + 55/1536*sqrt(-c^2*x^2 + 1)*b^2*d^2*
x*arcsin(c*x)/c^3 - 11/3456*(c^2*x^2 - 1)^3*b^2*d^2/c^4 + 55/1536*sqrt(-c^2
*x^2 + 1)*a*b*d^2*x/c^3 + 55/9216*(c^2*x^2 - 1)^2*b^2*d^2/c^4 + 55/3072*b^2
*d^2*arcsin(c*x)^2/c^4 - 55/3072*(c^2*x^2 - 1)*b^2*d^2/c^4 + 55/1536*a*b*d^
2*arcsin(c*x)/c^4 - 9835/884736*b^2*d^2/c^4
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.167 $\int x^2(d-c^2dx^2)^2(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=310

$$-\frac{1636b^2d^2x}{11025c^2}-\frac{818b^2d^2x^3}{33075}+\frac{136b^2c^2d^2x^5}{6125}-\frac{2}{343}b^2c^4d^2x^7+\frac{32bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{315c^3}+\frac{16bd^2x^2\sqrt{1-c^2x^2}}{}$$

```
[Out] -1636/11025*b^2*d^2*x/c^2-818/33075*b^2*d^2*x^3+136/6125*b^2*c^2*d^2*x^5-2/
343*b^2*c^4*d^2*x^7+8/105*b*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c^3+2/
175*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c^3-2/49*b*d^2*(-c^2*x^2+1)^
(7/2)*(a+b*arcsin(c*x))/c^3+8/105*d^2*x^3*(a+b*arcsin(c*x))^2+4/35*d^2*x^3*
(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/7*d^2*x^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x
))^2+32/315*b*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/315*b*d^2*x^2
*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.40, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 380}

$$\frac{16bd^2x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{315c}+\frac{1}{7}d^2x^3(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2+\frac{4}{35}d^2x^3(1-c^2x^2)(a+b\text{ArcSin}(cx))^2-\frac{2bd^2(1-c^2x^2)^{7/2}(a+b\text{ArcSin}(cx))}{49c^3}+\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{175c^3}+\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{105c^3}+\frac{32bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{315c^3}+\frac{8}{105}d^2x^3(a+b\text{ArcSin}(cx))^2-\frac{2}{343}b^2c^4d^2x^7+\frac{136b^2c^2d^2x^5}{6125}-\frac{1636b^2d^2x}{11025c^2}-\frac{818b^2d^2x^3}{33075}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-1636*b^2*d^2*x)/(11025*c^2) - (818*b^2*d^2*x^3)/33075 + (136*b^2*c^2*d^2*
x^5)/6125 - (2*b^2*c^4*d^2*x^7)/343 + (32*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(315*c^3) + (16*b*d^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(315*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*c^3) + (
2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c^3) - (2*b*d^2*(1 -
c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c^3) + (8*d^2*x^3*(a + b*ArcSin[c*x
])^2)/105 + (4*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (d^2*x^3*(
1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{7}(4d)\int x^2\left(d-c^2dx^2\right)\left(a\right.$$

$$=\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{35c^3}-\frac{2bd^2\left(1-c^2x^2\right)^{7/2}\left(a+b\sin\right.}{49c^3}$$

$$=\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{105c^3}+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin\right.}{175c^3}$$

$$=\frac{16bd^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{315c}+\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\,\mathrm{s}\right.}{105c^3}$$

$$=-\frac{172b^2d^2x}{3675c^2}-\frac{818b^2d^2x^3}{33075}+\frac{136b^2c^2d^2x^5}{6125}-\frac{2}{343}b^2c^4d^2x^7+\frac{32bd^2}{}$$

$$=-\frac{1636b^2d^2x}{11025c^2}-\frac{818b^2d^2x^3}{33075}+\frac{136b^2c^2d^2x^5}{6125}-\frac{2}{343}b^2c^4d^2x^7+\frac{32bd}{}$$

Mathematica [A]
time = 0.14, size = 229, normalized size = 0.74

$$\frac{d^2\left(11025a^2c^3x^3(35-42c^2x^2+15c^4x^4)+210ab\sqrt{1-c^2x^2}\,(818+409c^2x^2-612c^4x^4+225c^6x^6)-2b^2cx(85890+14315c^2x^2-12852c^4x^4+3375c^6x^6)+210b\left(105ac^3x^3(35-42c^2x^2+15c^4x^4)+b\sqrt{1-c^2x^2}\,(818+409c^2x^2-612c^4x^4+225c^6x^6)\right)\mathrm{ArcSin}(cx)+11025b^2c^3x^3(35-42c^2x^2+15c^4x^4)\,\mathrm{ArcSin}(cx)^2\right)}{1157625c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

[Out] (d^2*(11025*a^2*c^3*x^3*(35 - 42*c^2*x^2 + 15*c^4*x^4) + 210*a*b*Sqrt[1 - c
^2*x^2]*(818 + 409*c^2*x^2 - 612*c^4*x^4 + 225*c^6*x^6) - 2*b^2*c*x*(85890
+ 14315*c^2*x^2 - 12852*c^4*x^4 + 3375*c^6*x^6) + 210*b*(105*a*c^3*x^3*(35
- 42*c^2*x^2 + 15*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(818 + 409*c^2*x^2 - 612*c
^4*x^4 + 225*c^6*x^6))*ArcSin[c*x] + 11025*b^2*c^3*x^3*(35 - 42*c^2*x^2 + 1
5*c^4*x^4)*ArcSin[c*x]^2))/(1157625*c^3)

Maple [A]
time = 0.09, size = 400, normalized size = 1.29

method	result
derivativedivides	$\frac{d^2a^2\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{175}-\frac{2\left(3c^4x^4\right.}{}\right.}{}$
default	$\frac{d^2a^2\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{175}-\frac{2\left(3c^4x^4\right.}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/c^3*(d^2*a^2*(1/7*c^7*x^7-2/5*c^5*x^5+1/3*c^3*x^3)+d^2*b^2*(1/15*arcsin(c
x)^2(3*c^4*x^4-10*c^2*x^2+15)*c*x+2/175*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x
^2+1)^(1/2)-2/2625*(3*c^4*x^4-10*c^2*x^2+15)*c*x-8/315*arcsin(c*x)*(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)+8/945*(c^2*x^2-3)*c*x-16/105*c*x+16/105*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)+1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*
c*x+2/49*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/1715*(5*c^6*x^6-21*
c^4*x^4+35*c^2*x^2-35)*c*x)+2*d^2*a*b*(1/7*arcsin(c*x)*c^7*x^7-2/5*arcsin(c
*x)*c^5*x^5+1/3*c^3*x^3*arcsin(c*x)+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-68/1225
*c^4*x^4*(-c^2*x^2+1)^(1/2)+409/11025*c^2*x^2*(-c^2*x^2+1)^(1/2)+818/11025*
(-c^2*x^2+1)^(1/2)))

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 634 vs. $2(274) = 548$.
time = 0.53, size = 634, normalized size = 2.05

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] 1/7*b^2*c^4*d^2*x^7*arcsin(c*x)^2 + 1/7*a^2*c^4*d^2*x^7 - 2/5*b^2*c^2*d^2*x
^5*arcsin(c*x)^2 - 2/5*a^2*c^2*d^2*x^5 + 2/245*(35*x^7*arcsin(c*x) + (5*sqr
t(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^4*d^2 + 2/25725*(105*(5*sq

```
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*
c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^4*d^2 + 1/3*b^2*d^2*x^3*arcsin(c
*x)^2 - 4/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-
c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*d^2 - 4/1125*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^2*d^2 + 1/3*a^2*d^2*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^2 + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)
*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2
*d^2
```

Fricas [A]
time = 2.51, size = 296, normalized size = 0.95

$$\frac{3375\,(49\,a^2-2\,b^2)c^7d^2x^7-378\,(1225\,a^2-68\,b^2)c^5d^2x^5+35\,(11025\,a^2-818\,b^2)c^3d^2x^3-171780\,b^2cd^2x+11025\,(15\,b^2c^7d^2x^7-42\,b^2c^5d^2x^5+35\,b^2c^3d^2x^3)\arcsin(cx)^2+22050\,(15\,abc^7d^2x^7-42\,abc^5d^2x^5+35\,abc^3d^2x^3)\arcsin(cx)+210\,(225\,abc^6d^2x^6-612\,abc^4d^2x^4+409\,abc^2d^2x^2+818\,abd^2+(225\,b^2c^6d^2x^6-612\,b^2c^4d^2x^4+409\,b^2c^2d^2x^2+818\,b^2d^2)\arcsin(cx))\sqrt{-c^2x^2+1}}{1157625\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/1157625*(3375*(49*a^2 - 2*b^2)*c^7*d^2*x^7 - 378*(1225*a^2 - 68*b^2)*c^5*
d^2*x^5 + 35*(11025*a^2 - 818*b^2)*c^3*d^2*x^3 - 171780*b^2*c*d^2*x + 11025
*(15*b^2*c^7*d^2*x^7 - 42*b^2*c^5*d^2*x^5 + 35*b^2*c^3*d^2*x^3)*arcsin(c*x)
^2 + 22050*(15*a*b*c^7*d^2*x^7 - 42*a*b*c^5*d^2*x^5 + 35*a*b*c^3*d^2*x^3)*a
rcsin(c*x) + 210*(225*a*b*c^6*d^2*x^6 - 612*a*b*c^4*d^2*x^4 + 409*a*b*c^2*d
^2*x^2 + 818*a*b*d^2 + (225*b^2*c^6*d^2*x^6 - 612*b^2*c^4*d^2*x^4 + 409*b^2
*c^2*d^2*x^2 + 818*b^2*d^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A]
time = 1.18, size = 483, normalized size = 1.56

$$\begin{cases} \frac{a^2c^4d^2x^7}{7}-\frac{2a^2c^2d^2x^5}{5}+\frac{a^2d^2x^3}{3}+\frac{2abc^4d^2x^7\operatorname{asin}(cx)}{7}+\frac{2abc^3d^2x^6\sqrt{-c^2x^2+1}}{49}-\frac{4abc^2d^2x^5\operatorname{asin}(cx)}{5}-\frac{136abcd^2x^4\sqrt{-c^2x^2+1}}{1225}+\frac{2abd^2x^3\operatorname{asin}(cx)}{3}+\frac{818abd^2x^2\sqrt{-c^2x^2+1}}{11025c}+\frac{1636abd^2\sqrt{-c^2x^2+1}}{11025c^3}+\frac{b^2c^4d^2x^7\operatorname{asin}^2(cx)}{7}-\frac{2b^2c^4d^2x^7}{343}+\frac{2b^2c^3d^2x^6\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{49}-\frac{2b^2c^2d^2x^5\operatorname{asin}^2(cx)}{5}+\frac{136b^2c^2d^2x^5}{6125}-\frac{136b^2cd^2x^4\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{1225}+\frac{b^2d^2x^3\operatorname{asin}^2(cx)}{3}-\frac{818b^2d^2x^3}{33075}+\frac{818b^2d^2x^2\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{11025c}-\frac{1636b^2d^2x}{11025c^2}+\frac{1636b^2d^2\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{11025c^3} & \text{for}\ c \neq 0 \\ \frac{a^2d^2x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**7/7 - 2*a**2*c**2*d**2*x**5/5 + a**2*d**2*x**3
/3 + 2*a*b*c**4*d**2*x**7*asin(c*x)/7 + 2*a*b*c**3*d**2*x**6*sqrt(-c**2*x**
2 + 1)/49 - 4*a*b*c**2*d**2*x**5*asin(c*x)/5 - 136*a*b*c*d**2*x**4*sqrt(-c*
*2*x**2 + 1)/1225 + 2*a*b*d**2*x**3*asin(c*x)/3 + 818*a*b*d**2*x**2*sqrt(-c
**2*x**2 + 1)/(11025*c) + 1636*a*b*d**2*sqrt(-c**2*x**2 + 1)/(11025*c**3) +
 b**2*c**4*d**2*x**7*asin(c*x)**2/7 - 2*b**2*c**4*d**2*x**7/343 + 2*b**2*c*
*3*d**2*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/49 - 2*b**2*c**2*d**2*x**5*asin
(c*x)**2/5 + 136*b**2*c**2*d**2*x**5/6125 - 136*b**2*c*d**2*x**4*sqrt(-c**2
*x**2 + 1)*asin(c*x)/1225 + b**2*d**2*x**3*asin(c*x)**2/3 - 818*b**2*d**2*x
**3/33075 + 818*b**2*d**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(11025*c) - 1
```

```
636*b**2*d**2*x/(11025*c**2) + 1636*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x
)/(11025*c**3), Ne(c, 0)), (a**2*d**2*x**3/3, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 553 vs. 2(274) = 548.
time = 0.46, size = 553, normalized size = 1.78

$$\frac{1}{7}a^2c^4d^2x^7-\frac{2}{5}a^2c^2d^2x^5+\frac{(c^2x^2-1)^3b^2d^2x\arcsin(cx)^2}{7c^2}+\frac{1}{3}a^2d^2x^3+\frac{2(c^2x^2-1)^3abd^2x\arcsin(cx)}{7c^2}+\frac{(c^2x^2-1)^2b^2d^2x\arcsin(cx)^2}{35c^2}-\frac{2(c^2x^2-1)^3b^2d^2x}{343c^2}+\frac{2(c^2x^2-1)^2abd^2x\arcsin(cx)}{35c^2}-\frac{4(c^2x^2-1)b^2d^2x\arcsin(cx)^2}{105c^2}+\frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,b^2d^2\arcsin(cx)}{49c^3}+\frac{202(c^2x^2-1)^2b^2d^2x}{42875c^2}-\frac{8(c^2x^2-1)abd^2x\arcsin(cx)}{105c^2}+\frac{8b^2d^2x\arcsin(cx)^2}{105c^2}+\frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,abd^2}{49c^3}+\frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,b^2d^2\arcsin(cx)}{175c^3}+\frac{2528(c^2x^2-1)b^2d^2x}{1157625c^2}+\frac{16abd^2x\arcsin(cx)}{105c^2}+\frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,abd^2}{175c^3}+\frac{8(-c^2x^2+1)^{\frac{3}{2}}b^2d^2\arcsin(cx)}{315c^3}-\frac{181456b^2d^2x}{1157625c^2}+\frac{8(-c^2x^2+1)^{\frac{3}{2}}abd^2}{315c^3}+\frac{16\sqrt{-c^2x^2+1}\,b^2d^2\arcsin(cx)}{105c^3}+\frac{16\sqrt{-c^2x^2+1}\,abd^2}{105c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/7*a^2*c^4*d^2*x^7 - 2/5*a^2*c^2*d^2*x^5 + 1/7*(c^2*x^2 - 1)^3*b^2*d^2*x*a
rcsin(c*x)^2/c^2 + 1/3*a^2*d^2*x^3 + 2/7*(c^2*x^2 - 1)^3*a*b*d^2*x*arcsin(c
*x)/c^2 + 1/35*(c^2*x^2 - 1)^2*b^2*d^2*x*arcsin(c*x)^2/c^2 - 2/343*(c^2*x^2
 - 1)^3*b^2*d^2*x/c^2 + 2/35*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x)/c^2 - 4/
105*(c^2*x^2 - 1)*b^2*d^2*x*arcsin(c*x)^2/c^2 + 2/49*(c^2*x^2 - 1)^3*sqrt(-
c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 202/42875*(c^2*x^2 - 1)^2*b^2*d^2*x/
c^2 - 8/105*(c^2*x^2 - 1)*a*b*d^2*x*arcsin(c*x)/c^2 + 8/105*b^2*d^2*x*arcsi
n(c*x)^2/c^2 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3 + 2/175*
(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 2528/1157625*(
c^2*x^2 - 1)*b^2*d^2*x/c^2 + 16/105*a*b*d^2*x*arcsin(c*x)/c^2 + 2/175*(c^2*
x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3 + 8/315*(-c^2*x^2 + 1)^(3/2)*b^2*
d^2*arcsin(c*x)/c^3 - 181456/1157625*b^2*d^2*x/c^2 + 8/315*(-c^2*x^2 + 1)^(
3/2)*a*b*d^2/c^3 + 16/105*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 16/1
05*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.168 $\int x(d-c^2dx^2)^2 (a+b\mathbf{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=209

$$-\frac{25}{288}b^2d^2x^2+\frac{5}{288}b^2c^2d^2x^4+\frac{b^2d^2(1-c^2x^2)^3}{108c^2}+\frac{5bd^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{48c}+\frac{5bd^2x(1-c^2x^2)^{3/2}\,(a+$$

```
[Out] -25/288*b^2*d^2*x^2+5/288*b^2*c^2*d^2*x^4+1/108*b^2*d^2*(-c^2*x^2+1)^3/c^2+
5/72*b*d^2*x*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+1/18*b*d^2*x*(-c^2*x^2+
1)^(5/2)*(a+b*arcsin(c*x))/c+5/96*d^2*(a+b*arcsin(c*x))^2/c^2-1/6*d^2*(-c^2
*x^2+1)^3*(a+b*arcsin(c*x))^2/c^2+5/48*b*d^2*x*(a+b*arcsin(c*x))*(-c^2*x^2+
1)^(1/2)/c
```

Rubi [A]
time = 0.14, antiderivative size = 209, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4767, 4743, 4741, 4737, 30, 14, 267}

$$\frac{bd^2x(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))}{18c}+\frac{5bd^2x(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{72c}+\frac{5bd^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{48c}-\frac{d^2(1-c^2x^2)^3\,(a+b\text{ArcSin}(cx))^2}{6c^2}+\frac{5d^2(a+b\text{ArcSin}(cx))^2}{96c^2}+\frac{5}{288}b^2c^2d^2x^4+\frac{b^2d^2(1-c^2x^2)^3}{108c^2}-\frac{25}{288}b^2d^2x^2$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-25*b^2*d^2*x^2)/288 + (5*b^2*c^2*d^2*x^4)/288 + (b^2*d^2*(1 - c^2*x^2)^3)
/(108*c^2) + (5*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(48*c) + (5*
b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(72*c) + (b*d^2*x*(1 - c^2
*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(18*c) + (5*d^2*(a + b*ArcSin[c*x])^2)/(96
*c^2) - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(6*c^2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x(d-c^2dx^2)^2 (a+b\sin^{-1}(cx))^2\, dx = -\frac{d^2(1-c^2x^2)^3 (a+b\sin^{-1}(cx))^2}{6c^2} + \frac{(bd^2)\int (1-c^2x^2)^{5/2} (a+b\,\mathrm{si}}{3c}$$

$$= \frac{bd^2x(1-c^2x^2)^{5/2} (a+b\sin^{-1}(cx))}{18c} - \frac{d^2(1-c^2x^2)^3 (a+b\sin^{-1}(c}{6c^2}$$

$$= \frac{b^2d^2(1-c^2x^2)^3}{108c^2} + \frac{5bd^2x(1-c^2x^2)^{3/2} (a+b\sin^{-1}(cx))}{72c} + \frac{bd^2x(1}{}$$

$$= \frac{b^2d^2(1-c^2x^2)^3}{108c^2} + \frac{5bd^2x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{48c} + \frac{5bd^2x(1-}{}$$

$$= -\frac{25}{288}b^2d^2x^2 + \frac{5}{288}b^2c^2d^2x^4 + \frac{b^2d^2(1-c^2x^2)^3}{108c^2} + \frac{5bd^2x\sqrt{1-c^2x^2}}{4}$$

Mathematica [A]
time = 0.16, size = 209, normalized size = 1.00

$$\frac{d^2\left(cx\left(b^2cx(-99+39c^2x^2-8c^4x^4)+144a^2cx(3-3c^2x^2+c^4x^4)+6ab\sqrt{1-c^2x^2}\,(33-26c^2x^2+8c^4x^4)\right)+6b\left(bcx\sqrt{1-c^2x^2}\,(33-26c^2x^2+8c^4x^4)+3a(-11+48c^2x^2-48c^4x^4+16c^6x^6)\right)\mathrm{ArcSin}(cx)+9b^2(-11+48c^2x^2-48c^4x^4+16c^6x^6)\,\mathrm{ArcSin}(cx)^2\right)}{864c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(c*x*(b^2*c*x*(-99 + 39*c^2*x^2 - 8*c^4*x^4) + 144*a^2*c*x*(3 - 3*c^2*
x^2 + c^4*x^4) + 6*a*b*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + 6
*b*(b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 3*a*(-11 + 48*c
^2*x^2 - 48*c^4*x^4 + 16*c^6*x^6))*ArcSin[c*x] + 9*b^2*(-11 + 48*c^2*x^2 -
48*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]^2))/(864*c^2)
```

Maple [A]
time = 0.08, size = 270, normalized size = 1.29

method	result
derivativedivides	$\frac{\frac{d^2(c^2x^2-1)^3a^2}{6}+d^2b^2\left(\frac{\arcsin(cx)^2(c^2x^2-1)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33cx\sqrt{-}\right.}{144}\right.}{}$
default	$\frac{\frac{d^2(c^2x^2-1)^3a^2}{6}+d^2b^2\left(\frac{\arcsin(cx)^2(c^2x^2-1)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33cx\sqrt{-}\right.}{144}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/6*d^2*(c^2*x^2-1)^3*a^2+d^2*b^2*(1/6*arcsin(c*x)^2*(c^2*x^2-1)^3+1
/144*arcsin(c*x)*(8*c^5*x^5*(-c^2*x^2+1)^(1/2)-26*c^3*x^3*(-c^2*x^2+1)^(1/2
)+33*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-5/96*arcsin(c*x)^2-1/108*(c^2*x
^2-1)^3+5/288*(c^2*x^2-1)^2-5/96*c^2*x^2+5/96)+2*d^2*a*b*(1/6*arcsin(c*x)*c
^6*x^6-1/2*c^4*x^4*arcsin(c*x)+1/2*c^2*x^2*arcsin(c*x)-11/96*arcsin(c*x)+1/
36*c^5*x^5*(-c^2*x^2+1)^(1/2)-13/144*c^3*x^3*(-c^2*x^2+1)^(1/2)+11/96*c*x*(
-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*c^4*d^2*x^6 - 1/2*a^2*c^2*d^2*x^4 + 1/144*(48*x^6*arcsin(c*x) + (8*
sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x
^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^4*d^2 - 1/8*(8*x^4*arcsin(c*x)
 + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*
x)/c^5)*c)*a*b*c^2*d^2 + 1/2*a^2*d^2*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt
(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d^2 + 1/6*(b^2*c^4*d^2*x^6 - 3
*b^2*c^2*d^2*x^4 + 3*b^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)^2 + integrate(1/3*(b^2*c^5*d^2*x^6 - 3*b^2*c^3*d^2*x^4 + 3*b^2*c*d^2*x^2)
*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c
^2*x^2 - 1), x)
```

Fricas [A]
time = 2.90, size = 278, normalized size = 1.33

$$\frac{8\,(18\,a^2-b^2)c^6d^2x^6-3\,(144\,a^2-13\,b^2)c^4d^2x^4+9\,(48\,a^2-11\,b^2)c^2d^2x^2+9\,(16\,b^2c^6d^2x^6-48\,b^2c^4d^2x^4+48\,b^2c^2d^2x^2-11\,b^2d^2)\arcsin(cx)^2+18\,(16\,abc^6d^2x^6-48\,abc^4d^2x^4+48\,abc^2d^2x^2-11\,abd^2)\arcsin(cx)+6\,(8\,abc^5d^2x^5-26\,abc^3d^2x^3+33\,abcd^2x+(8\,b^2c^5d^2x^5-26\,b^2c^3d^2x^3+33\,b^2cd^2x)\arcsin(cx))\sqrt{-c^2x^2+1}}{864\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/864*(8*(18*a^2 - b^2)*c^6*d^2*x^6 - 3*(144*a^2 - 13*b^2)*c^4*d^2*x^4 + 9*
(48*a^2 - 11*b^2)*c^2*d^2*x^2 + 9*(16*b^2*c^6*d^2*x^6 - 48*b^2*c^4*d^2*x^4
+ 48*b^2*c^2*d^2*x^2 - 11*b^2*d^2)*arcsin(c*x)^2 + 18*(16*a*b*c^6*d^2*x^6 -
 48*a*b*c^4*d^2*x^4 + 48*a*b*c^2*d^2*x^2 - 11*a*b*d^2)*arcsin(c*x) + 6*(8*a
*b*c^5*d^2*x^5 - 26*a*b*c^3*d^2*x^3 + 33*a*b*c*d^2*x + (8*b^2*c^5*d^2*x^5 -
 26*b^2*c^3*d^2*x^3 + 33*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 430 vs. 2(196) = 392.
time = 0.89, size = 430, normalized size = 2.06

$$\begin{cases} \frac{a^2c^4d^2x^6}{6} - \frac{a^2c^2d^2x^4}{2} + \frac{a^2d^2x^2}{2} + \frac{abc^4d^2x^6\operatorname{asin}(cx)}{3} + \frac{abc^3d^2x^5\sqrt{-c^2x^2+1}}{18} - abc^2d^2x^4\operatorname{asin}(cx) - \frac{13abcd^2x^3\sqrt{-c^2x^2+1}}{72} + abd^2x^2\operatorname{asin}(cx) + \frac{11abd^2x\sqrt{-c^2x^2+1}}{48c} - \frac{11abd^2\operatorname{asin}(cx)}{48c^2} + \frac{b^2c^4d^2x^6\operatorname{asin}^2(cx)}{6} - \frac{b^2c^4d^2x^6}{108} + \frac{b^2c^3d^2x^5\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{18} - \frac{b^2c^2d^2x^4\operatorname{asin}^2(cx)}{2} + \frac{13b^2c^2d^2x^4}{288} - \frac{13b^2cd^2x^3\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{72} + \frac{b^2d^2x^2\operatorname{asin}^2(cx)}{2} - \frac{11b^2d^2x^2}{96} + \frac{11b^2d^2x\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{48c} - \frac{11b^2d^2\operatorname{asin}^2(cx)}{96c^2} & \text{for}\: c \neq 0 \\ \frac{a^2d^2x^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**6/6 - a**2*c**2*d**2*x**4/2 + a**2*d**2*x**2/2
 + a*b*c**4*d**2*x**6*asin(c*x)/3 + a*b*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)
/18 - a*b*c**2*d**2*x**4*asin(c*x) - 13*a*b*c*d**2*x**3*sqrt(-c**2*x**2 + 1
)/72 + a*b*d**2*x**2*asin(c*x) + 11*a*b*d**2*x*sqrt(-c**2*x**2 + 1)/(48*c)
- 11*a*b*d**2*asin(c*x)/(48*c**2) + b**2*c**4*d**2*x**6*asin(c*x)**2/6 - b*
*2*c**4*d**2*x**6/108 + b**2*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/
18 - b**2*c**2*d**2*x**4*asin(c*x)**2/2 + 13*b**2*c**2*d**2*x**4/288 - 13*b
**2*c*d**2*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/72 + b**2*d**2*x**2*asin(c*x
)**2/2 - 11*b**2*d**2*x**2/96 + 11*b**2*d**2*x*sqrt(-c**2*x**2 + 1)*asin(c*
x)/(48*c) - 11*b**2*d**2*asin(c*x)**2/(96*c**2), Ne(c, 0)), (a**2*d**2*x**2
/2, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 383 vs. 2(185) = 370.
time = 0.45, size = 383, normalized size = 1.83

$$\frac{1}{6}a^2c^4d^2x^6-\frac{1}{2}a^2c^2d^2x^4+\frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,b^2d^2x\arcsin(cx)}{18\,c}+\frac{(c^2x^2-1)^3b^2d^2\arcsin(cx)^2}{6\,c^2}+\frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,abd^2x}{18\,c}+\frac{5\,(-c^2x^2+1)^{\frac{3}{2}}b^2d^2x\arcsin(cx)}{72\,c}+\frac{(c^2x^2-1)^3abd^2\arcsin(cx)}{3\,c^2}+\frac{5\,(-c^2x^2+1)^{\frac{3}{2}}abd^2x}{72\,c}+\frac{5\sqrt{-c^2x^2+1}\,b^2d^2x\arcsin(cx)}{48\,c}-\frac{(c^2x^2-1)^3b^2d^2}{108\,c^2}+\frac{5\sqrt{-c^2x^2+1}\,abd^2x}{48\,c}+\frac{5\,(c^2x^2-1)^2b^2d^2}{288\,c^2}+\frac{5\,b^2d^2\arcsin(cx)^2}{96\,c^2}+\frac{(c^2x^2-1)a^2d^2}{2\,c^2}-\frac{5\,(c^2x^2-1)b^2d^2}{96\,c^2}+\frac{5\,abd^2\arcsin(cx)}{48\,c^2}-\frac{245\,b^2d^2}{6912\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/6*a^2*c^4*d^2*x^6 - 1/2*a^2*c^2*d^2*x^4 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*
x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c + 1/6*(c^2*x^2 - 1)^3*b^2*d^2*arcsin(c*x)^
2/c^2 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^2*x/c + 5/72*(-c^2*x^
2 + 1)^(3/2)*b^2*d^2*x*arcsin(c*x)/c + 1/3*(c^2*x^2 - 1)^3*a*b*d^2*arcsin(c
*x)/c^2 + 5/72*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*x/c + 5/48*sqrt(-c^2*x^2 + 1)*b
^2*d^2*x*arcsin(c*x)/c - 1/108*(c^2*x^2 - 1)^3*b^2*d^2/c^2 + 5/48*sqrt(-c^2
*x^2 + 1)*a*b*d^2*x/c + 5/288*(c^2*x^2 - 1)^2*b^2*d^2/c^2 + 5/96*b^2*d^2*ar
csin(c*x)^2/c^2 + 1/2*(c^2*x^2 - 1)*a^2*d^2/c^2 - 5/96*(c^2*x^2 - 1)*b^2*d^
2/c^2 + 5/48*a*b*d^2*arcsin(c*x)/c^2 - 245/6912*b^2*d^2/c^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.169 $\int \left(d-c^2 d x^2\right)^2 (a+b\textbf{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=219

$$-\frac{298}{225}b^2d^2x+\frac{76}{675}b^2c^2d^2x^3-\frac{2}{125}b^2c^4d^2x^5+\frac{16bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{15c}+\frac{8bd^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSi}}{45c}$$

```
[Out] -298/225*b^2*d^2*x+76/675*b^2*c^2*d^2*x^3-2/125*b^2*c^4*d^2*x^5+8/45*b*d^2*
(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+2/25*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*a
rcsin(c*x))/c+8/15*d^2*x*(a+b*arcsin(c*x))^2+4/15*d^2*x*(-c^2*x^2+1)*(a+b*a
rcsin(c*x))^2+1/5*d^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+16/15*b*d^2*(a+b
*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.18, antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4743, 4715, 4767, 8, 200}

$$\frac{1}{5}d^2x\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2+\frac{4}{15}d^2x\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))}{25c}+\frac{8bd^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}{45c}+\frac{16bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{15c}+\frac{8}{15}d^2x(a+b\text{ArcSin}(cx))^2-\frac{2}{125}b^2c^4d^2x^5+\frac{76}{675}b^2c^2d^2x^3-\frac{298}{225}b^2d^2x$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-298*b^2*d^2*x)/225 + (76*b^2*c^2*d^2*x^3)/675 - (2*b^2*c^4*d^2*x^5)/125 +
 (16*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(15*c) + (8*b*d^2*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(25*c) + (8*d^2*x*(a + b*ArcSin[c*x])^2)/15 + (4*d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/15 + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSi
n[c*x])^2)/5
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^2 \left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{5}d^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{5}(4d)\int\left(d-c^2dx^2\right)\left(a+b\,\mathrm{s}\right.$$

$$=\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{25c}+\frac{4}{15}d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.$$

$$=\frac{8bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{45c}+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-}\right.}{25c}$$

$$=-\frac{58}{225}b^2d^2x+\frac{76}{675}b^2c^2d^2x^3-\frac{2}{125}b^2c^4d^2x^5+\frac{16bd^2\sqrt{1-c^2x^2}\left(a+\right.}{15c}$$

$$=-\frac{298}{225}b^2d^2x+\frac{76}{675}b^2c^2d^2x^3-\frac{2}{125}b^2c^4d^2x^5+\frac{16bd^2\sqrt{1-c^2x^2}\left(a+\right.}{15c}$$

Mathematica [A]
time = 0.17, size = 193, normalized size = 0.88

$$\frac{d^2\left(225a^2cx(15-10c^2x^2+3c^4x^4)+30ab\sqrt{1-c^2x^2}\,(149-38c^2x^2+9c^4x^4)-2b^2cx(2235-190c^2x^2+27c^4x^4)+30b\left(15acx(15-10c^2x^2+3c^4x^4)+b\sqrt{1-c^2x^2}\,(149-38c^2x^2+9c^4x^4)\right)\mathrm{ArcSin}(cx)+225b^2cx(15-10c^2x^2+3c^4x^4)\,\mathrm{ArcSin}(cx)^2\right)}{3375c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(225*a^2*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 30*a*b*Sqrt[1 - c^2*x^2]*
(149 - 38*c^2*x^2 + 9*c^4*x^4) - 2*b^2*c*x*(2235 - 190*c^2*x^2 + 27*c^4*x^4
) + 30*b*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(149
 - 38*c^2*x^2 + 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*c*x*(15 - 10*c^2*x^2 + 3*
c^4*x^4)*ArcSin[c*x]^2))/(3375*c)
```

Maple [A]
time = 0.07, size = 275, normalized size = 1.26

method	result
derivativedivides	$\frac{d^2a^2\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{25}-\frac{2\left(3c^4x^4-10\right.}{37}\right.}{}$
default	$\frac{d^2a^2\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{25}-\frac{2\left(3c^4x^4-10\right.}{37}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(d^2*a^2*(1/5*c^5*x^5-2/3*c^3*x^3+c*x)+d^2*b^2*(1/15*arcsin(c*x)^2*(3*c
^4*x^4-10*c^2*x^2+15)*c*x+2/25*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)
-2/375*(3*c^4*x^4-10*c^2*x^2+15)*c*x-8/45*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2
+1)^(1/2)+8/135*(c^2*x^2-3)*c*x-16/15*c*x+16/15*arcsin(c*x)*(-c^2*x^2+1)^(1
/2))+2*d^2*a*b*(1/5*arcsin(c*x)*c^5*x^5-2/3*c^3*x^3*arcsin(c*x)+c*x*arcsin(
c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-38/225*c^2*x^2*(-c^2*x^2+1)^(1/2)+149/
225*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 465 vs. 2(193) = 386.
time = 0.54, size = 465, normalized size = 2.12

$$\frac{1}{5}b^2c^4d^2x^5\arcsin(cx)^2+\frac{1}{5}a^2c^4d^2x^5-\frac{2}{3}b^2c^2d^2x^3\arcsin(cx)^2+\frac{2}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^4d^2+\frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx)-\frac{9c^4x^5+20c^2x^3+120x}{c^4}\right)b^2c^4d^2-\frac{2}{3}a^2c^2d^2x^3-\frac{4}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abc^2d^2-\frac{4}{27}\left(3c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx)-\frac{c^2x^3+6x}{c^2}\right)b^2c^2d^2+b^2d^2x\arcsin(cx)^2-2b^2d^2\left(x-\frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right)+a^2d^2x+\frac{2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)abd^2}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*c^4*d^2*x^5*arcsin(c*x)^2 + 1/5*a^2*c^4*d^2*x^5 - 2/3*b^2*c^2*d^2*x
^3*arcsin(c*x)^2 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^4*d^2
+ 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 +
 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)
/c^4)*b^2*c^4*d^2 - 2/3*a^2*c^2*d^2*x^3 - 4/9*(3*x^3*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d^2 - 4/27*(3*c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*
x^3 + 6*x)/c^2)*b^2*c^2*d^2 + b^2*d^2*x*arcsin(c*x)^2 - 2*b^2*d^2*(x - sqrt
(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*a*b*d^2/c
```

Fricas [A]
time = 2.82, size = 247, normalized size = 1.13

$$\frac{27\,(25\,a^2-2\,b^2)c^5d^2x^5-10\,(225\,a^2-38\,b^2)c^3d^2x^3+15\,(225\,a^2-298\,b^2)cd^2x+225\,(3\,b^2c^5d^2x^5-10\,b^2c^3d^2x^3+15\,b^2cd^2x)\arcsin(cx)^2+450\,(3\,abc^5d^2x^5-10\,abc^3d^2x^3+15\,abcd^2x)\arcsin(cx)+30\,(9\,abc^4d^2x^4-38\,abc^2d^2x^2+149\,abd^2+(9\,b^2c^4d^2x^4-38\,b^2c^2d^2x^2+149\,b^2d^2)\arcsin(cx))\sqrt{-c^2x^2+1}}{3375\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/3375*(27*(25*a^2 - 2*b^2)*c^5*d^2*x^5 - 10*(225*a^2 - 38*b^2)*c^3*d^2*x^3
 + 15*(225*a^2 - 298*b^2)*c*d^2*x + 225*(3*b^2*c^5*d^2*x^5 - 10*b^2*c^3*d^2
*x^3 + 15*b^2*c*d^2*x)*arcsin(c*x)^2 + 450*(3*a*b*c^5*d^2*x^5 - 10*a*b*c^3*
d^2*x^3 + 15*a*b*c*d^2*x)*arcsin(c*x) + 30*(9*a*b*c^4*d^2*x^4 - 38*a*b*c^2*
d^2*x^2 + 149*a*b*d^2 + (9*b^2*c^4*d^2*x^4 - 38*b^2*c^2*d^2*x^2 + 149*b^2*d
^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A]
time = 0.58, size = 389, normalized size = 1.78

$$\begin{cases} \frac{a^2c^4d^2x^5}{5} - \frac{2a^2c^2d^2x^3}{3} + a^2d^2x + \frac{2abc^4d^2x^5 \operatorname{asin}(cx)}{5} + \frac{2abc^3d^2x^4\sqrt{-c^2x^2+1}}{25} - \frac{4abc^2d^2x^3 \operatorname{asin}(cx)}{3} - \frac{76abcd^2x^2\sqrt{-c^2x^2+1}}{225} + 2abd^2x \operatorname{asin}(cx) + \frac{298abd^2\sqrt{-c^2x^2+1}}{225c} + \frac{b^2c^4d^2x^5 \operatorname{asin}^2(cx)}{5} - \frac{2b^2c^4d^2x^5}{125} + \frac{2b^2c^3d^2x^4\sqrt{-c^2x^2+1} \operatorname{asin}(cx)}{25} - \frac{2b^2c^2d^2x^3 \operatorname{asin}^2(cx)}{3} + \frac{76b^2c^2d^2x^3}{675} - \frac{76b^2cd^2x^2\sqrt{-c^2x^2+1} \operatorname{asin}(cx)}{225} + b^2d^2x \operatorname{asin}^2(cx) - \frac{298b^2d^2x}{225} + \frac{298b^2d^2\sqrt{-c^2x^2+1} \operatorname{asin}(cx)}{225c} & \text{for } c \neq 0 \\ a^2d^2x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**5/5 - 2*a**2*c**2*d**2*x**3/3 + a**2*d**2*x +
2*a*b*c**4*d**2*x**5*asin(c*x)/5 + 2*a*b*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1
)/25 - 4*a*b*c**2*d**2*x**3*asin(c*x)/3 - 76*a*b*c*d**2*x**2*sqrt(-c**2*x**
2 + 1)/225 + 2*a*b*d**2*x*asin(c*x) + 298*a*b*d**2*sqrt(-c**2*x**2 + 1)/(22
5*c) + b**2*c**4*d**2*x**5*asin(c*x)**2/5 - 2*b**2*c**4*d**2*x**5/125 + 2*b
**2*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/25 - 2*b**2*c**2*d**2*x**
3*asin(c*x)**2/3 + 76*b**2*c**2*d**2*x**3/675 - 76*b**2*c*d**2*x**2*sqrt(-c
**2*x**2 + 1)*asin(c*x)/225 + b**2*d**2*x*asin(c*x)**2 - 298*b**2*d**2*x/22
5 + 298*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*c), Ne(c, 0)), (a**2*
d**2*x, True))
```

Giac [A]
time = 0.45, size = 374, normalized size = 1.71

$$\frac{1}{5}a^2c^4d^2x^5 - \frac{2}{3}a^2c^2d^2x^3 + \frac{1}{5}\left(c^2x^2-1\right)^2b^2d^2x \arcsin(cx)^2 + \frac{2}{5}\left(c^2x^2-1\right)^2abd^2x \arcsin(cx) - \frac{4}{15}\left(c^2x^2-1\right)b^2d^2x \arcsin(cx)^2 - \frac{2}{125}\left(c^2x^2-1\right)^2b^2d^2x - \frac{8}{15}\left(c^2x^2-1\right)abd^2x \arcsin(cx) + \frac{8}{15}b^2d^2x \arcsin(cx)^2 + \frac{2\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\,b^2d^2 \arcsin(cx)}{25\,c} + \frac{272}{3375}\left(c^2x^2-1\right)b^2d^2x + \frac{16}{15}abd^2x \arcsin(cx) + \frac{2\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\,abd^2}{25\,c} + \frac{8\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2d^2 \arcsin(cx)}{45\,c} + a^2d^2x - \frac{4144}{3375}b^2d^2x + \frac{8\left(-c^2x^2+1\right)^{\frac{3}{2}}abd^2}{45\,c} + \frac{16\sqrt{-c^2x^2+1}\,b^2d^2 \arcsin(cx)}{15\,c} + \frac{16\sqrt{-c^2x^2+1}\,abd^2}{15\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/5*a^2*c^4*d^2*x^5 - 2/3*a^2*c^2*d^2*x^3 + 1/5*(c^2*x^2 - 1)^2*b^2*d^2*x*a
rcsin(c*x)^2 + 2/5*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x) - 4/15*(c^2*x^2 -
1)*b^2*d^2*x*arcsin(c*x)^2 - 2/125*(c^2*x^2 - 1)^2*b^2*d^2*x - 8/15*(c^2*x^
2 - 1)*a*b*d^2*x*arcsin(c*x) + 8/15*b^2*d^2*x*arcsin(c*x)^2 + 2/25*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c + 272/3375*(c^2*x^2 - 1)*b
^2*d^2*x + 16/15*a*b*d^2*x*arcsin(c*x) + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
 + 1)*a*b*d^2/c + 8/45*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*arcsin(c*x)/c + a^2*d^2
*x - 4144/3375*b^2*d^2*x + 8/45*(-c^2*x^2 + 1)^(3/2)*a*b*d^2/c + 16/15*sqrt
(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c + 16/15*sqrt(-c^2*x^2 + 1)*a*b*d^2/c
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.170 $\int \frac{(d-c^2dx^2)^2(a+b\mathbf{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=271

$$\frac{13}{32}b^2c^2d^2x^2-\frac{1}{32}b^2c^4d^2x^4-\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{1}{8}bcd^2x(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))-\frac{11}{32}$$

```
[Out] 13/32*b^2*c^2*d^2*x^2-1/32*b^2*c^4*d^2*x^4-1/8*b*c*d^2*x*(-c^2*x^2+1)^(3/2)
*(a+b*arcsin(c*x))-11/32*d^2*(a+b*arcsin(c*x))^2+1/2*d^2*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2+1/4*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2-1/3*I*d^2*(a+b*ar
csin(c*x))^3/b+d^2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I
*b*d^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b^2*d^
2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-11/16*b*c*d^2*x*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$, Rules used = {4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 4743, 14}

$$-\frac{1}{8}bcd^2x(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))-\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{4}d^2(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2+\frac{1}{2}d^2(1-c^2x^2)(a+b\text{ArcSin}(cx))^2-ibd^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{id^2(a+b\text{ArcSin}(cx))^3}{3b}-\frac{11}{32}d^2(a+b\text{ArcSin}(cx))^2+d^2\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2+\frac{1}{2}b^2d^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{32}b^2c^4d^2x^4+\frac{13}{32}b^2c^2d^2x^2$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (13*b^2*c^2*d^2*x^2)/32 - (b^2*c^4*d^2*x^4)/32 - (11*b*c*d^2*x*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x]))/16 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/8 - (11*d^2*(a + b*ArcSin[c*x])^2)/32 + (d^2*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/2 + (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - ((I/3)*
d^2*(a + b*ArcSin[c*x])^3)/b + d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*A
rcSin[c*x])] - I*b*d^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])
] + (b^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
```

```
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2\,(a+b\sin^{-1}(cx))^2}{x}\,dx = \frac{1}{4}d^2(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))^2 + d\int \frac{(d-c^2dx^2)\,(a+b\sin^{-1}(cx)}{x}$$

$$= -\frac{1}{8}bcd^2x(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx)) + \frac{1}{2}d^2(1-c^2x^2)\,(a+b\sin^{-}$$

$$= -\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)) - \frac{1}{8}bcd^2x(1-c^2x^2)^{3/2}\,(a+b$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)) -$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)) -$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)) -$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)) -$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)) -$$

Mathematica [A]
time = 0.28, size = 371, normalized size = 1.37

$$\frac{1}{768}d^2\left(-32ib^2\pi^3-768a^2c^2x^2+192a^2c^4x^4-624abcx\sqrt{1-c^2x^2}+96abc^3x^3\sqrt{1-c^2x^2}-1536abc^2x^2\text{ArcSin}(cx)+384abc^4x^4\text{ArcSin}(cx)-768iab\text{ArcSin}(cx)^2+256ib^2\text{ArcSin}(cx)^3+1248ab\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)-144b^2\cos(2\text{ArcSin}(cx))+288b^2\text{ArcSin}(cx)^2\cos(2\text{ArcSin}(cx))-3b^2\cos(4\text{ArcSin}(cx))+24b^2\text{ArcSin}(cx)^2\cos(4\text{ArcSin}(cx))+768b^2\text{ArcSin}(cx)^2\log\left(1-e^{-2i\text{ArcSin}(cx)}\right)+1536ab\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+768a^2\log(cx)+768ib^2\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(cx)}\right)-768iab\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)+384b^2\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(cx)}\right)-288b^2\text{ArcSin}(cx)\sin(2\text{ArcSin}(cx))-12b^2\text{ArcSin}(cx)\sin(4\text{ArcSin}(cx))\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^2*((-32*I)*b^2*Pi^3 - 768*a^2*c^2*x^2 + 192*a^2*c^4*x^4 - 624*a*b*c*x*Sq
rt[1 - c^2*x^2] + 96*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] - 1536*a*b*c^2*x^2*ArcSi
n[c*x] + 384*a*b*c^4*x^4*ArcSin[c*x] - (768*I)*a*b*ArcSin[c*x]^2 + (256*I)*
b^2*ArcSin[c*x]^3 + 1248*a*b*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])] - 144*b
^2*Cos[2*ArcSin[c*x]] + 288*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 3*b^2*Co
s[4*ArcSin[c*x]] + 24*b^2*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 768*b^2*ArcSin
[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 1536*a*b*ArcSin[c*x]*Log[1 - E^((
2*I)*ArcSin[c*x])] + 768*a^2*Log[c*x] + (768*I)*b^2*ArcSin[c*x]*PolyLog[2,
E^((-2*I)*ArcSin[c*x])] - (768*I)*a*b*PolyLog[2, E^((2*I)*ArcSin[c*x])] + 3
84*b^2*PolyLog[3, E^((-2*I)*ArcSin[c*x])] - 288*b^2*ArcSin[c*x]*Sin[2*ArcSi
n[c*x]] - 12*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]]))/768
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 559 vs. 2(277) = 554.
time = 0.33, size = 560, normalized size = 2.07

method	result
derivativedivides	$d^2a^2\ln(cx) - \frac{d^2b^2\cos(4\arcsin(cx))}{256} - \frac{3d^2b^2\cos(2\arcsin(cx))}{16} + 2d^2b^2\,\mathrm{polylog}\left(3, icx + \sqrt{-c^2x^2 +}\right.$
default	$d^2a^2\ln(cx) - \frac{d^2b^2\cos(4\arcsin(cx))}{256} - \frac{3d^2b^2\cos(2\arcsin(cx))}{16} + 2d^2b^2\,\mathrm{polylog}\left(3, icx + \sqrt{-c^2x^2 +}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a^2*ln(c*x)+2*d^2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*d^2*b^2*pol
ylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-1/256*d^2*b^2*cos(4*arcsin(c*x))-3/16*d^2
*b^2*cos(2*arcsin(c*x))-2*I*d^2*b^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1
)^(1/2))-2*I*d^2*b^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*d^2
*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/4*d^2*a^2*c^4*x^4-d^2*a^2
*c^2*x^2+d^2*b^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+d^2*b^2*arcsi
n(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/32*d^2*b^2*arcsin(c*x)^2*cos(4*ar
csin(c*x))-1/64*d^2*b^2*arcsin(c*x)*sin(4*arcsin(c*x))+3/8*d^2*b^2*arcsin(c
*x)^2*cos(2*arcsin(c*x))-3/8*d^2*b^2*arcsin(c*x)*sin(2*arcsin(c*x))-1/3*I*d
^2*b^2*arcsin(c*x)^3-1/64*d^2*a*b*sin(4*arcsin(c*x))-3/8*d^2*a*b*sin(2*arcs
in(c*x))+2*d^2*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/16*d^2*a*b*
arcsin(c*x)*cos(4*arcsin(c*x))+3/4*d^2*a*b*arcsin(c*x)*cos(2*arcsin(c*x))-I
*d^2*a*b*arcsin(c*x)^2-2*I*d^2*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*I*
d^2*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] 1/4*a^2*c^4*d^2*x^4 - a^2*c^2*d^2*x^2 + a^2*d^2*log(x) + integrate(((b^2*c^
4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^2\left(\int \frac{a^2}{x}\, dx + \int \left(-2a^2c^2x\right) dx + \int a^2c^4x^3\, dx + \int \frac{b^2 \operatorname{asin}^2(cx)}{x}\, dx + \int \frac{2ab \operatorname{asin}(cx)}{x}\, dx + \int \left(-2b^2c^2x \operatorname{asin}^2(cx)\right) dx + \int b^2c^4x^3 \operatorname{asin}^2(cx)\, dx + \int \left(-4abc^2x \operatorname{asin}(cx)\right) dx + \int 2abc^4x^3 \operatorname{asin}(cx)\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x,x)
```

```
[Out] d**2*(Integral(a**2/x, x) + Integral(-2*a**2*c**2*x, x) + Integral(a**2*c**
4*x**3, x) + Integral(b**2*asin(c*x)**2/x, x) + Integral(2*a*b*asin(c*x)/x,
 x) + Integral(-2*b**2*c**2*x*asin(c*x)**2, x) + Integral(b**2*c**4*x**3*as
in(c*x)**2, x) + Integral(-4*a*b*c**2*x*asin(c*x), x) + Integral(2*a*b*c**4
*x**3*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^2}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x, x)
```

3.171 $\int \frac{(d-c^2dx^2)^2(a+b\textbf{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=249

$$\frac{32}{9}b^2c^2d^2x-\frac{2}{27}b^2c^4d^2x^3-\frac{10}{3}bcd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))-\frac{8}{3}c^2d^2$$

```
[Out] 32/9*b^2*c^2*d^2*x-2/27*b^2*c^4*d^2*x^3-2/9*b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+b
*arcsin(c*x))-8/3*c^2*d^2*x*(a+b*arcsin(c*x))^2-4/3*c^2*d^2*x*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2-d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x-4*b*c*d^2*(a+b
*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*c*d^2*polylog(2,-I*
c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*c*d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1
0/3*b*c*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.34, antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4785, 4743, 4715, 4767, 8, 4787, 4783, 4803, 4268, 2317, 2438}

$$-\frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2-\frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))-\frac{10}{3}bcd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{d^2\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2}{x}-\frac{8}{3}c^2d^2x(a+b\text{ArcSin}(cx))^2-4bcd^2\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))+2ib^2cd^2\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)-2ib^2cd^2\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)-\frac{2}{27}b^2c^4d^2x^3+\frac{32}{9}b^2c^2d^2x$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (32*b^2*c^2*d^2*x)/9 - (2*b^2*c^4*d^2*x^3)/27 - (10*b*c*d^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/3 - (2*b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/9 - (8*c^2*d^2*x*(a + b*ArcSin[c*x])^2)/3 - (4*c^2*d^2*x*(1 - c^2*x^2)
*(a + b*ArcSin[c*x])^2)/3 - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/x -
 4*b*c*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^2
*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^2*PolyLog[2, E^(I*ArcSin[c*
x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
```

```
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x} - \left(4c^2d\right)\int\left(d-c^2dx^2\right)\left(a+b\sin$$

$$= \frac{2}{3}bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)\left(a+b\sin$$

$$= -\frac{2}{3}b^2c^2d^2x + \frac{2}{9}b^2c^4d^2x^3 + 2bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}bc$$

$$= -\frac{16}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) -$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{2}{9}$$

Mathematica [**A**]

time = 0.64, size = 322, normalized size = 1.29

$$\frac{1}{54}d^2\left(-\frac{54a^2}{x}-108a^2c^2x+18a^2c^4x^3+12abc\sqrt{1-c^2x^2}\,(2+c^2x^2)+36abc^4x^3\text{ArcSin}(cx)-189b^2c\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)-216abc\left(\sqrt{1-c^2x^2}+cx\text{ArcSin}(cx)\right)-108b^2c^2x(-2+\text{ArcSin}(cx)^2)+2b^2c^2x(-2(6+c^2x^2)+9c^2x^2\text{ArcSin}(cx)^2)-\frac{108ab\left(\text{ArcSin}(cx)+cx\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)\right)}{x}-3b^2c\text{ArcSin}(cx)\cos(3\text{ArcSin}(cx))-\frac{54b^2\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2cx\left(-\log\left(1-e^{i\text{ArcSin}(cx)}\right)+\log\left(1+e^{i\text{ArcSin}(cx)}\right)\right)\right)}{x}+108ib^2c\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-108ib^2c\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^2*((-54*a^2)/x - 108*a^2*c^2*x + 18*a^2*c^4*x^3 + 12*a*b*c*Sqrt[1 - c^2*
x^2]*(2 + c^2*x^2) + 36*a*b*c^4*x^3*ArcSin[c*x] - 189*b^2*c*Sqrt[1 - c^2*x^
2]*ArcSin[c*x] - 216*a*b*c*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) - 108*b^2*
c^2*x*(-2 + ArcSin[c*x]^2) + 2*b^2*c^2*x*(-2*(6 + c^2*x^2) + 9*c^2*x^2*ArcS
in[c*x]^2) - (108*a*b*(ArcSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]))/x - 3
*b^2*c*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - (54*b^2*ArcSin[c*x]*(ArcSin[c*x] +
2*c*x*(-Log[1 - E^(I*ArcSin[c*x])] + Log[1 + E^(I*ArcSin[c*x])])))/x + (108
*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])] - (108*I)*b^2*c*PolyLog[2, E^(I*Ar
cSin[c*x])]))/54
```

Maple [**A**]
time = 0.33, size = 372, normalized size = 1.49

method	result
derivativedivides	$c\left(d^2a^2\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)-\frac{7d^2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{2}-\frac{7d^2b^2\arcsin(cx)^2cx}{4}+\frac{7d^2b^2cx}{2}-\frac{d^2b^2}{}\right.$
default	$c\left(d^2a^2\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)-\frac{7d^2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{2}-\frac{7d^2b^2\arcsin(cx)^2cx}{4}+\frac{7d^2b^2cx}{2}-\frac{d^2b^2}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(d^2*a^2*(1/3*c^3*x^3-2*c*x-1/c/x)-7/2*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)-7/4*d^2*b^2*arcsin(c*x)^2*c*x+7/2*d^2*b^2*c*x-d^2*b^2/c/x*arcsin(c*x)^
2+2*d^2*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*d^2*b^2*arcsin(c*x
)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*d^2*b^2*polylog(2,I*c*x+(-c^2*x^2+1)^(
1/2))+2*I*d^2*b^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-1/18*d^2*b^2*arcsin(
c*x)*cos(3*arcsin(c*x))-1/12*d^2*b^2*arcsin(c*x)^2*sin(3*arcsin(c*x))+1/54*
d^2*b^2*sin(3*arcsin(c*x))+2*d^2*a*b*(1/3*c^3*x^3*arcsin(c*x)-2*c*x*arcsin(
c*x)-1/c/x*arcsin(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/9*(-c^2*x^2+1)^(1/
2)-arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^2*c^4*d^2*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^4*d^2 - 2*b^2*c^2*d^2*x*arcsin(c*x)^2
+ 4*b^2*c^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) - 2*a^2*c^2*d^2*x -
4*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d^2 - 2*(c*log(2*sqrt(-c^2*x
^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d^2 - a^2*d^2/x + 1/3*((b^2
*c^4*d^2*x^4 - 3*b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 3*
x*integrate(2/3*(b^2*c^5*d^2*x^4 - 3*b^2*c*d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^3 - x), x))/x
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^{2}\left(\int \left(-2a^{2}c^{2}\right)\, dx + \int \frac{a^{2}}{x^{2}}\, dx + \int a^{2}c^{4}x^{2}\, dx + \int \left(-2b^{2}c^{2}\operatorname{asin}^{2}{\left(cx \right)}\right)\, dx + \int \frac{b^{2}\operatorname{asin}^{2}{\left(cx \right)}}{x^{2}}\, dx + \int \left(-4abc^{2}\operatorname{asin}{\left(cx \right)}\right)\, dx + \int \frac{2ab\operatorname{asin}{\left(cx \right)}}{x^{2}}\, dx + \int b^{2}c^{4}x^{2}\operatorname{asin}^{2}{\left(cx \right)}\, dx + \int 2abc^{4}x^{2}\operatorname{asin}{\left(cx \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] d**2*(Integral(-2*a**2*c**2, x) + Integral(a**2/x**2, x) + Integral(a**2*c*
*4*x**2, x) + Integral(-2*b**2*c**2*asin(c*x)**2, x) + Integral(b**2*asin(c
*x)**2/x**2, x) + Integral(-4*a*b*c**2*asin(c*x), x) + Integral(2*a*b*asin(
c*x)/x**2, x) + Integral(b**2*c**4*x**2*asin(c*x)**2, x) + Integral(2*a*b*c
**4*x**2*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^2,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^2, x)
```

3.172 $\int \frac{(d-c^2dx^2)^2(a+b\mathbf{ArcSin}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=287

$$-\frac{1}{4}b^2c^4d^2x^2-\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{bcd^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{x}-\frac{1}{4}c^2d^2(a+b\text{ArcSi}$$

```
[Out] -1/4*b^2*c^4*d^2*x^2-b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/x-1/4*c^2
*d^2*(a+b*arcsin(c*x))^2-c^2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2-1/2*d^2*(
-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x^2+2/3*I*c^2*d^2*(a+b*arcsin(c*x))^3/b-2
*c^2*d^2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+b^2*c^2*d^2
*ln(x)+2*I*b*c^2*d^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
^2)-b^2*c^2*d^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c^3*d^2*x*(a+
b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.33, antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$, Rules used = {4785, 4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 14}

$$2ibc^2d^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-c^2d^2\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2-\frac{bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}{x}-\frac{d^2\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2}{2x^2}+\frac{2ic^2d^2(a+b\text{ArcSin}(cx))^3}{3b}-\frac{1}{4}c^2d^2(a+b\text{ArcSin}(cx))^2-2c^2d^2\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2-\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-b^2c^2d^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{4}b^2c^4d^2x^2+b^2c^2d^2\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -1/4*(b^2*c^4*d^2*x^2) - (b*c^3*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/2 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x - (c^2*d^2*(a + b
*ArcSin[c*x])^2)/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2 - (d^2*(1
- c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*x^2) + (((2*I)/3)*c^2*d^2*(a + b*Arc
Sin[c*x])^3)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*
x])] + b^2*c^2*d^2*Log[x] + (2*I)*b*c^2*d^2*(a + b*ArcSin[c*x])*PolyLog[2,
E^((2*I)*ArcSin[c*x])] - b^2*c^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
```

```
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2 (a+b\sin^{-1}(cx))^2}{x^3}\,dx = -\frac{d^2(1-c^2x^2)^2 (a+b\sin^{-1}(cx))^2}{2x^2} - (2c^2d)\int \frac{(d-c^2dx^2)(a+b\sin^{-1}}{x}$$

$$= -\frac{bcd^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}{x} - c^2d^2(1-c^2x^2)\left(a+b\sin^{-1}(c\right.$$

$$= -\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\sin}{x}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1-c^2x^2)}{}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1-c^2x^2)}{}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1-c^2x^2)}{}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1-c^2x^2)}{}$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1-c^2x^2)}{}$$

Mathematica [A]
time = 0.57, size = 361, normalized size = 1.26

$$\frac{1}{2}d^2\left(-\frac{a^2}{x^2}+a^2c^4x^2+2abc^4x^2\text{ArcSin}(cx)-\frac{2ab\left(cx\sqrt{1-c^2x^2}+\text{ArcSin}(cx)\right)}{x^2}+abc^2\left(cx\sqrt{1-c^2x^2}-2\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)-\frac{1}{4}b^2c^2(-1+2\text{ArcSin}(cx)^2)\cos(2\text{ArcSin}(cx))-8abc^2\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-4a^2c^2\log(x)-\frac{b^2\left(2cx\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+\text{ArcSin}(cx)^2-2c^2x^2\log(cx)\right)}{x^2}+4iabc^2\left(\text{ArcSin}(cx)^2+\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)+\frac{1}{6}ib^2c^2\left(\pi^3-8\text{ArcSin}(cx)^3+24i\text{ArcSin}(cx)^2\log\left(1-e^{-2i\text{ArcSin}(cx)}\right)-24\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(cx)}\right)+12i\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(cx)}\right)\right)+\frac{1}{2}b^2c^2\text{ArcSin}(cx)\sin(2\text{ArcSin}(cx))\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d^2*(-(a^2/x^2) + a^2*c^4*x^2 + 2*a*b*c^4*x^2*ArcSin[c*x] - (2*a*b*(c*x*Sq
rt[1 - c^2*x^2] + ArcSin[c*x]))/x^2 + a*b*c^2*(c*x*Sqrt[1 - c^2*x^2] - 2*Ar
cTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]) - (b^2*c^2*(-1 + 2*ArcSin[c*x]^2)*Cos
[2*ArcSin[c*x]])/4 - 8*a*b*c^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
 4*a^2*c^2*Log[x] - (b^2*(2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]
^2 - 2*c^2*x^2*Log[c*x]))/x^2 + (4*I)*a*b*c^2*(ArcSin[c*x]^2 + PolyLog[2, E
^((2*I)*ArcSin[c*x])]) + (I/6)*b^2*c^2*(Pi^3 - 8*ArcSin[c*x]^3 + (24*I)*Arc
Sin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] - 24*ArcSin[c*x]*PolyLog[2, E^((
-2*I)*ArcSin[c*x])] + (12*I)*PolyLog[3, E^((-2*I)*ArcSin[c*x])]) + (b^2*c^2
*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/2))/2
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 716 vs. 2(301) = 602.
time = 0.63, size = 717, normalized size = 2.50

method	result
derivativedivides	$c^2\left(\frac{d^2ab\sqrt{-c^2x^2+1}\,cx}{2} - 2d^2a^2\ln(cx) - 4d^2b^2\,\mathrm{polylog}\left(3, icx+\sqrt{-c^2x^2+1}\right) - 4d^2b^2\right.$
default	$c^2\left(\frac{d^2ab\sqrt{-c^2x^2+1}\,cx}{2} - 2d^2a^2\ln(cx) - 4d^2b^2\,\mathrm{polylog}\left(3, icx+\sqrt{-c^2x^2+1}\right) - 4d^2b^2\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(1/2*d^2*a*b*(-c^2*x^2+1)^(1/2)*c*x-2*d^2*a^2*ln(c*x)-4*d^2*b^2*polylog
(3,I*c*x+(-c^2*x^2+1)^(1/2))-4*d^2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))
+1/8*d^2*b^2-4*d^2*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+d^2*a*b*a
rcsin(c*x)*c^2*x^2-d^2*a*b/c/x*(-c^2*x^2+1)^(1/2)-d^2*a*b*arcsin(c*x)/c^2/x
^2+1/2*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-d^2*b^2*arcsin(c*x)/c/x*(
-c^2*x^2+1)^(1/2)+1/2*d^2*a^2*c^2*x^2-2*d^2*b^2*arcsin(c*x)^2*ln(1-I*c*x-(-
c^2*x^2+1)^(1/2))-2*d^2*b^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/
4*b^2*c^2*d^2*x^2-1/4*d^2*b^2*arcsin(c*x)^2+d^2*b^2*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))+d^2*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-2*d^2*b^2*ln(I*c*x+(-c^2*x^2
+1)^(1/2))-1/2*d^2*b^2*arcsin(c*x)^2/c^2/x^2+1/2*d^2*b^2*arcsin(c*x)^2*c^2*
x^2+2*I*d^2*a*b*arcsin(c*x)^2+4*I*d^2*a*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))+4*I*d^2*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+4*I*d^2*b^2*arcsin(c*x)
*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+4*I*d^2*b^2*arcsin(c*x)*polylog(2,I*c
*x+(-c^2*x^2+1)^(1/2))-4*d^2*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
+I*d^2*b^2*arcsin(c*x)+2/3*I*d^2*b^2*arcsin(c*x)^3-1/2*d^2*a^2/c^2/x^2-1/2*
d^2*a*b*arcsin(c*x)+I*d^2*a*b)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*c^4*d^2*x^2 - 2*a^2*c^2*d^2*log(x) - a*b*d^2*(sqrt(-c^2*x^2 + 1)*c/
x + arcsin(c*x)/x^2) - 1/2*a^2*d^2/x^2 + integrate(((b^2*c^4*d^2*x^4 - 2*b^
2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(
a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))/x^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^{2}\left(\int \frac{a^{2}}{x^{3}}\, dx + \int \left(-\frac{2a^{2}c^{2}}{x}\right) dx + \int a^{2}c^{4}x\, dx + \int \frac{b^{2}\operatorname{asin}^{2}(cx)}{x^{3}}\, dx + \int \frac{2ab\operatorname{asin}(cx)}{x^{3}}\, dx + \int \left(-\frac{2b^{2}c^{2}\operatorname{asin}^{2}(cx)}{x}\right) dx + \int b^{2}c^{4}x\operatorname{asin}^{2}(cx)\, dx + \int \left(-\frac{4abc^{2}\operatorname{asin}(cx)}{x}\right) dx + \int 2abc^{4}x\operatorname{asin}(cx)\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] d**2*(Integral(a**2/x**3, x) + Integral(-2*a**2*c**2/x, x) + Integral(a**2*
c**4*x, x) + Integral(b**2*asin(c*x)**2/x**3, x) + Integral(2*a*b*asin(c*x)
/x**3, x) + Integral(-2*b**2*c**2*asin(c*x)**2/x, x) + Integral(b**2*c**4*x
*asin(c*x)**2, x) + Integral(-4*a*b*c**2*asin(c*x)/x, x) + Integral(2*a*b*c
**4*x*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^2}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^3, x)
```

3.173 $\int \frac{\left(d-c^2dx^2\right)^2(a+b\mathbf{ArcSin}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=268

$$-\frac{b^2c^2d^2}{3x}-2b^2c^4d^2x+\frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}{3x^2}+\frac{8}{3}c^4d^2x(a+b$$

```
[Out] -1/3*b^2*c^2*d^2/x-2*b^2*c^4*d^2*x-1/3*b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcs
in(c*x))/x^2+8/3*c^4*d^2*x*(a+b*arcsin(c*x))^2+4/3*c^2*d^2*(-c^2*x^2+1)*(a+
b*arcsin(c*x))^2/x-1/3*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x^3+22/3*b*c^
3*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))-11/3*I*b^2*c^3*d^
2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+11/3*I*b^2*c^3*d^2*polylog(2,I*c*x+(
-c^2*x^2+1)^(1/2))+5/3*b*c^3*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.45, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.370$, Rules used = {4785, 4715, 4767, 8, 4783, 4803, 4268, 2317, 2438, 14}

$$\frac{8}{3}c^4d^2x(a+b\text{ArcSin}(cx))^2+\frac{22}{3}bc^3d^2\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))+\frac{4c^2d^2\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2}{3x}-\frac{bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}{3x^2}-\frac{d^2\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2}{3x^3}+\frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{11}{3}ib^2c^3d^2\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)+\frac{11}{3}ib^2c^3d^2\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)-2b^2c^4d^2x-\frac{b^2c^2d^2}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d^2)/x - 2*b^2*c^4*d^2*x + (5*b*c^3*d^2*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*
x^2) + (8*c^4*d^2*x*(a + b*ArcSin[c*x])^2)/3 + (4*c^2*d^2*(1 - c^2*x^2)*(a
+ b*ArcSin[c*x])^2)/(3*x) - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*
x^3) + (22*b*c^3*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((
11*I)/3)*b^2*c^3*d^2*PolyLog[2, -E^(I*ArcSin[c*x])] + ((11*I)/3)*b^2*c^3*d^
2*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
```

```
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx = -\frac{d^2\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{3x^3} - \frac{1}{3}\left(4c^2d\right)\int \frac{\left(d-c^2dx^2\right)\left(a+b\sin\right.}{x^2}$$

$$= -\frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} + \frac{4c^2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.}{3x}$$

$$= -\frac{11}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin\right.}{3x^2}$$

$$= -\frac{b^2c^2d^2}{3x} + \frac{10}{3}b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2}{}$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1}{}$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1}{}$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^2(1}{}$$

Mathematica [A]
time = 0.58, size = 374, normalized size = 1.40

$$\frac{d^2\left(-a^2+6a^2c^2x^2-b^2c^2x^2+3a^2c^4x^4-6b^2c^4x^4-abcx\sqrt{1-c^2x^2}+6abc^3x^3\sqrt{1-c^2x^2}-2ab\text{ArcSin}(cx)+12abc^2x^2\text{ArcSin}(cx)+6abc^4x^4\text{ArcSin}(cx)-b^2cx\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+6b^2c^3x^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)-b^2\text{ArcSin}(cx)^2+6b^2c^2x^2\text{ArcSin}(cx)^2+3b^2c^4x^4\text{ArcSin}(cx)^2+11abc^3x^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-11b^2c^3x^3\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)+11b^2c^3x^3\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)-11ib^2c^3x^3\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)+11ib^2c^3x^3\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\right)}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d^2*(-a^2 + 6*a^2*c^2*x^2 - b^2*c^2*x^2 + 3*a^2*c^4*x^4 - 6*b^2*c^4*x^4 -
a*b*c*x*Sqrt[1 - c^2*x^2] + 6*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] - 2*a*b*ArcSin[
c*x] + 12*a*b*c^2*x^2*ArcSin[c*x] + 6*a*b*c^4*x^4*ArcSin[c*x] - b^2*c*x*Sqr
t[1 - c^2*x^2]*ArcSin[c*x] + 6*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] -
```

```
b^2*ArcSin[c*x]^2 + 6*b^2*c^2*x^2*ArcSin[c*x]^2 + 3*b^2*c^4*x^4*ArcSin[c*x]
^2 + 11*a*b*c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 11*b^2*c^3*x^3*ArcSin[c*x]
*Log[1 - E^(I*ArcSin[c*x])] + 11*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSi
n[c*x])] - (11*I)*b^2*c^3*x^3*PolyLog[2, -E^(I*ArcSin[c*x])] + (11*I)*b^2*c
^3*x^3*PolyLog[2, E^(I*ArcSin[c*x])]))/(3*x^3)
```

Maple [A]
time = 0.60, size = 378, normalized size = 1.41

method	result
derivativedivides	$c^3\left(d^2a^2\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+2d^2b^2\arcsin\left(cx\right)\sqrt{-c^2x^2+1}+d^2b^2\arcsin\left(cx\right)^2cx-2d^2b\right.$
default	$c^3\left(d^2a^2\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+2d^2b^2\arcsin\left(cx\right)\sqrt{-c^2x^2+1}+d^2b^2\arcsin\left(cx\right)^2cx-2d^2b\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(d^2*a^2*(c*x-1/3/c^3/x^3+2/c/x)+2*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/
2)+d^2*b^2*arcsin(c*x)^2*c*x-2*d^2*b^2*c*x+2*d^2*b^2/c/x*arcsin(c*x)^2-1/3*
d^2*b^2/c^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/3*d^2*b^2/c^3/x^3*arcsin(c
*x)^2-1/3*d^2*b^2/c/x-11/3*d^2*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))+11/3*I*d^2*b^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+11/3*d^2*b^2*arcsin(c
*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-11/3*I*d^2*b^2*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+2*d^2*a*b*(c*x*arcsin(c*x)-1/3/c^3/x^3*arcsin(c*x)+2/c/x*arcsin
(c*x)+(-c^2*x^2+1)^(1/2)-1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)+11/6*arctanh(1/(-c^
2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] b^2*c^4*d^2*x*arcsin(c*x)^2 - 2*b^2*c^4*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(
c*x)/c) + a^2*c^4*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c^3*
d^2 + 4*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b
*c^2*d^2 - 1/3*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^
2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*a*b*d^2 + 2*a^2*c^2*d^2/x - 1/3*a^2*
d^2/x^3 + 1/3*(3*x^3*integrate(2/3*(6*b^2*c^3*d^2*x^2 - b^2*c*d^2)*sqrt(c*x
```

```
 + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 -
x^3), x) + (6*b^2*c^2*d^2*x^2 - b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))^2)/x^3
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^4, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$d^{2}\left(\int a^{2}c^{4}\,dx + \int \frac{a^{2}}{x^{4}}\,dx + \int \left(-\frac{2a^{2}c^{2}}{x^{2}}\right)dx + \int b^{2}c^{4}\operatorname{asin}^{2}{\left(cx \right)}\,dx + \int \frac{b^{2}\operatorname{asin}^{2}{\left(cx \right)}}{x^{4}}\,dx + \int 2abc^{4}\operatorname{asin}{\left(cx \right)}\,dx + \int \frac{2ab\operatorname{asin}{\left(cx \right)}}{x^{4}}\,dx + \int \left(-\frac{2b^{2}c^{2}\operatorname{asin}^{2}{\left(cx \right)}}{x^{2}}\right)dx + \int \left(-\frac{4abc^{2}\operatorname{asin}{\left(cx \right)}}{x^{2}}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] d**2*(Integral(a**2*c**4, x) + Integral(a**2/x**4, x) + Integral(-2*a**2*c*
*2/x**2, x) + Integral(b**2*c**4*asin(c*x)**2, x) + Integral(b**2*asin(c*x)
**2/x**4, x) + Integral(2*a*b*c**4*asin(c*x), x) + Integral(2*a*b*asin(c*x)
/x**4, x) + Integral(-2*b**2*c**2*asin(c*x)**2/x**2, x) + Integral(-4*a*b*c
**2*asin(c*x)/x**2, x))
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^4, x)
```

3.174 $\int x^4(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=476

$$-\frac{100976b^2d^3x}{4002075c^4}-\frac{50488b^2d^3x^3}{12006225c^2}-\frac{12622b^2d^3x^5}{6670125}+\frac{9410b^2c^2d^3x^7}{1120581}-\frac{182b^2c^4d^3x^9}{29403}+\frac{2b^2c^6d^3x^{11}}{1331}+\frac{256bd^3\sqrt{1-c^2x^2}\,(a}{17325}$$

```
[Out] -100976/4002075*b^2*d^3*x/c^4-50488/12006225*b^2*d^3*x^3/c^2-12622/6670125*
b^2*d^3*x^5+9410/1120581*b^2*c^2*d^3*x^7-182/29403*b^2*c^4*d^3*x^9+2/1331*b
^2*c^6*d^3*x^11+16/693*b*d^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c^5-4/115
5*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c^5+2/1617*b*d^3*(-c^2*x^2+1)^
(7/2)*(a+b*arcsin(c*x))/c^5-8/297*b*d^3*(-c^2*x^2+1)^(9/2)*(a+b*arcsin(c*x)
)/c^5+2/121*b*d^3*(-c^2*x^2+1)^(11/2)*(a+b*arcsin(c*x))/c^5+16/1155*d^3*x^5
*(a+b*arcsin(c*x))^2+8/231*d^3*x^5*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+2/33*d^
3*x^5*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+1/11*d^3*x^5*(-c^2*x^2+1)^3*(a+b*a
rcsin(c*x))^2+256/17325*b*d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+128/
17325*b*d^3*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+32/5775*b*d^3*x^4*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.70, antiderivative size = 476, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 1167}

$$\frac{1}{11}d^3x^5(1-c^2x^2)^3(a+b\text{ArcSin}(cx))^2+\frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2+\frac{8}{231}d^3x^5(1-c^2x^2)(a+b\text{ArcSin}(cx))^2+\frac{32bd^3x^4\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{5775c}+\frac{2bd^3(1-c^2x^2)^{11/2}(a+b\text{ArcSin}(cx))}{121c^5}-\frac{8bd^3(1-c^2x^2)^{9/2}(a+b\text{ArcSin}(cx))}{297c^5}+\frac{2bd^3(1-c^2x^2)^{7/2}(a+b\text{ArcSin}(cx))}{1617c^5}-\frac{4bd^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{1155c^5}+\frac{16bd^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{693c^5}+\frac{256bd^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{17325c^5}+\frac{128bd^3x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{17325c^3}+\frac{16d^3x^5(a+b\text{ArcSin}(cx))^2}{1155}+\frac{2b^2c^6d^3x^{11}}{1331}-\frac{182b^2c^4d^3x^9}{29403}-\frac{100976b^2d^3x}{4002075c^4}+\frac{9410b^2c^2d^3x^7}{1120581}-\frac{50488b^2d^3x^3}{12006225c^2}-\frac{12622b^2d^3x^5}{6670125}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-100976*b^2*d^3*x)/(4002075*c^4) - (50488*b^2*d^3*x^3)/(12006225*c^2) - (1
2622*b^2*d^3*x^5)/6670125 + (9410*b^2*c^2*d^3*x^7)/1120581 - (182*b^2*c^4*d
^3*x^9)/29403 + (2*b^2*c^6*d^3*x^11)/1331 + (256*b*d^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(17325*c^5) + (128*b*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(17325*c^3) + (32*b*d^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(5775*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(693*c^5)
 - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(1155*c^5) + (2*b*d^3*
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(1617*c^5) - (8*b*d^3*(1 - c^2*x^2
)^(9/2)*(a + b*ArcSin[c*x]))/(297*c^5) + (2*b*d^3*(1 - c^2*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(121*c^5) + (16*d^3*x^5*(a + b*ArcSin[c*x])^2)/1155 + (8*d
^3*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/231 + (2*d^3*x^5*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x])^2)/33 + (d^3*x^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^
2)/11
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^4\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{11}d^3x^5\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{11}(6d)\int x^4\left(d-c^2dx^2\right)$$

$$=\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{77c^5}-\frac{4bd^3\left(1-c^2x^2\right)^{9/2}\left(a+b\sin\right.}{99c^5}$$

$$=\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{165c^5}-\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin\right.}{231c^5}$$

$$=\frac{16bd^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{693c^5}-\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\,\mathrm{s}\right.}{1155c^5}$$

$$=-\frac{16b^2d^3x}{7623c^4}-\frac{8b^2d^3x^3}{22869c^2}-\frac{2b^2d^3x^5}{12705}+\frac{226b^2c^2d^3x^7}{53361}-\frac{46b^2c^4d^3x^9}{9801}+$$

$$=-\frac{8368b^2d^3x}{800415c^4}-\frac{4184b^2d^3x^3}{2401245c^2}-\frac{12622b^2d^3x^5}{6670125}+\frac{9410b^2c^2d^3x^7}{1120581}-\frac{18}{}$$

$$=-\frac{8368b^2d^3x}{800415c^4}-\frac{50488b^2d^3x^3}{12006225c^2}-\frac{12622b^2d^3x^5}{6670125}+\frac{9410b^2c^2d^3x^7}{1120581}-$$

$$=-\frac{100976b^2d^3x}{4002075c^4}-\frac{50488b^2d^3x^3}{12006225c^2}-\frac{12622b^2d^3x^5}{6670125}+\frac{9410b^2c^2d^3x^7}{1120581}-$$

Mathematica [A]
time = 0.27, size = 301, normalized size = 0.63

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/13867189875*(d^3*(12006225*a^2*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4
 + 105*c^6*x^6) + 6930*a*b*Sqrt[1 - c^2*x^2]*(-50488 - 25244*c^2*x^2 - 1893
3*c^4*x^4 + 117625*c^6*x^6 - 111475*c^8*x^8 + 33075*c^10*x^10) + b^2*(34988
1840*c*x + 58313640*c^3*x^3 + 26241138*c^5*x^5 - 116448750*c^7*x^7 + 858357
50*c^9*x^9 - 20837250*c^11*x^11) + 6930*b*(3465*a*c^5*x^5*(-231 + 495*c^2*x
^2 - 385*c^4*x^4 + 105*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-50488 - 25244*c^2*x
^2 - 18933*c^4*x^4 + 117625*c^6*x^6 - 111475*c^8*x^8 + 33075*c^10*x^10))*Ar
cSin[c*x] + 12006225*b^2*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4 + 105*c^
6*x^6)*ArcSin[c*x]^2))/c^5
```

Maple [A]
time = 0.17, size = 672, normalized size = 1.41

method	result
derivativedivides	$\frac{-d^3a^2\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b^2\left(-\frac{2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{56595}+\frac{32cx}{1155}-\frac{32\arcsin(cx)\sqrt{-c^2x^2+1}}{1155}\right.}{}$
default	$\frac{-d^3a^2\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b^2\left(-\frac{2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{56595}+\frac{32cx}{1155}-\frac{32\arcsin(cx)\sqrt{-c^2x^2+1}}{1155}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/c^5*(-d^3*a^2*(1/11*c^11*x^11-1/3*c^9*x^9+3/7*c^7*x^7-1/5*c^5*x^5)-d^3*b^2*(-2/56595*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+32/1155*c*x-32/1155*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+8/297*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)^(1/2)+2/121*arcsin(c*x)*(c^2*x^2-1)^5*(-c^2*x^2+1)^(1/2)+2/1617*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/83853*(63*c^10*x^10-385*c^8*x^8+990*c^6*x^6-1386*c^4*x^4+1155*c^2*x^2-693)*c*x+4/28875*(3*c^4*x^4-10*c^2*x^2+15)*c*x+16/3465*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-8/93555*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x+1/693*arcsin(c*x)^2*(63*c^10*x^10-385*c^8*x^8+990*c^6*x^6-1386*c^4*x^4+1155*c^2*x^2-693)*c*x+1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+2/315*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x-4/1925*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)-16/10395*(c^2*x^2-3)*c*x)-2*d^3*a*b*(1/11*arcsin(c*x)*c^11*x^11-1/3*arcsin(c*x)*c^9*x^9+3/7*arcsin(c*x)*c^7*x^7-1/5*arcsin(c*x)*c^5*x^5+1/121*c^10*x^10*(-c^2*x^2+1)^(1/2)-91/3267*c^8*x^8*(-c^2*x^2+1)^(1/2)+4705/160083*c^6*x^6*(-c^2*x^2+1)^(1/2)-6311/1334025*c^4*x^4*(-c^2*x^2+1)^(1/2)-25244/4002075*c^2*x^2*(-c^2*x^2+1)^(1/2)-50488/4002075*(-c^2*x^2+1)^(1/2)))

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1141 vs. $2(421) = 842$.
time = 0.55, size = 1141, normalized size = 2.40

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] -1/11*b^2*c^6*d^3*x^11*arcsin(c*x)^2 - 1/11*a^2*c^6*d^3*x^11 + 1/3*b^2*c^4*d^3*x^9*arcsin(c*x)^2 + 1/3*a^2*c^4*d^3*x^9 - 3/7*b^2*c^2*d^3*x^7*arcsin(c*x)^2 - 3/7*a^2*c^2*d^3*x^7 - 2/7623*(693*x^11*arcsin(c*x) + (63*sqrt(-c^2*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^10 + 256*sqrt(-c^2*x^2 + 1)/c^12)*c)*a*b*c^6*d^3 - 2/26413695*(3465*(63*sqrt(-c^2

```
*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*
x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^10 +
 256*sqrt(-c^2*x^2 + 1)/c^12)*c*arcsin(c*x) - (19845*c^10*x^11 + 26950*c^8*
x^9 + 39600*c^6*x^7 + 66528*c^4*x^5 + 147840*c^2*x^3 + 887040*x)/c^10)*b^2*
c^6*d^3 + 1/5*b^2*d^3*x^5*arcsin(c*x)^2 + 2/945*(315*x^9*arcsin(c*x) + (35*
sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x
^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^
10)*c)*a*b*c^4*d^3 + 2/297675*(315*(35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt
(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 +
 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c*arcsin(c*x) - (1225*c^8*x^9 +
1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2*x^3 + 40320*x)/c^8)*b^2*c^4*d^3 + 1/
5*a^2*d^3*x^5 - 6/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 +
 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2
*x^2 + 1)/c^8)*c)*a*b*c^2*d^3 - 2/8575*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 +
 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2
*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 16
80*x)/c^6)*b^2*c^2*d^3 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x
^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d^
3 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4
 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*
x)/c^4)*b^2*d^3
```

Fricas [A]
time = 3.07, size = 413, normalized size = 0.87

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/13867189875*(10418625*(121*a^2 - 2*b^2)*c^11*d^3*x^11 - 471625*(9801*a^2
 - 182*b^2)*c^9*d^3*x^9 + 12375*(480249*a^2 - 9410*b^2)*c^7*d^3*x^7 - 2079*
(1334025*a^2 - 12622*b^2)*c^5*d^3*x^5 + 58313640*b^2*c^3*d^3*x^3 + 34988184
0*b^2*c*d^3*x + 12006225*(105*b^2*c^11*d^3*x^11 - 385*b^2*c^9*d^3*x^9 + 495
*b^2*c^7*d^3*x^7 - 231*b^2*c^5*d^3*x^5)*arcsin(c*x)^2 + 24012450*(105*a*b*c
^11*d^3*x^11 - 385*a*b*c^9*d^3*x^9 + 495*a*b*c^7*d^3*x^7 - 231*a*b*c^5*d^3*
x^5)*arcsin(c*x) + 6930*(33075*a*b*c^10*d^3*x^10 - 111475*a*b*c^8*d^3*x^8 +
 117625*a*b*c^6*d^3*x^6 - 18933*a*b*c^4*d^3*x^4 - 25244*a*b*c^2*d^3*x^2 - 5
0488*a*b*d^3 + (33075*b^2*c^10*d^3*x^10 - 111475*b^2*c^8*d^3*x^8 + 117625*b
^2*c^6*d^3*x^6 - 18933*b^2*c^4*d^3*x^4 - 25244*b^2*c^2*d^3*x^2 - 50488*b^2*
d^3)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 4.16, size = 702, normalized size = 1.47

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**11/11 + a**2*c**4*d**3*x**9/3 - 3*a**2*c**2*d
**3*x**7/7 + a**2*d**3*x**5/5 - 2*a*b*c**6*d**3*x**11*asin(c*x)/11 - 2*a*b*
c**5*d**3*x**10*sqrt(-c**2*x**2 + 1)/121 + 2*a*b*c**4*d**3*x**9*asin(c*x)/3
 + 182*a*b*c**3*d**3*x**8*sqrt(-c**2*x**2 + 1)/3267 - 6*a*b*c**2*d**3*x**7*
asin(c*x)/7 - 9410*a*b*c*d**3*x**6*sqrt(-c**2*x**2 + 1)/160083 + 2*a*b*d**3
*x**5*asin(c*x)/5 + 12622*a*b*d**3*x**4*sqrt(-c**2*x**2 + 1)/(1334025*c) +
50488*a*b*d**3*x**2*sqrt(-c**2*x**2 + 1)/(4002075*c**3) + 100976*a*b*d**3*s
qrt(-c**2*x**2 + 1)/(4002075*c**5) - b**2*c**6*d**3*x**11*asin(c*x)**2/11 +
 2*b**2*c**6*d**3*x**11/1331 - 2*b**2*c**5*d**3*x**10*sqrt(-c**2*x**2 + 1)*
asin(c*x)/121 + b**2*c**4*d**3*x**9*asin(c*x)**2/3 - 182*b**2*c**4*d**3*x**
9/29403 + 182*b**2*c**3*d**3*x**8*sqrt(-c**2*x**2 + 1)*asin(c*x)/3267 - 3*b
**2*c**2*d**3*x**7*asin(c*x)**2/7 + 9410*b**2*c**2*d**3*x**7/1120581 - 9410
*b**2*c*d**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/160083 + b**2*d**3*x**5*as
in(c*x)**2/5 - 12622*b**2*d**3*x**5/6670125 + 12622*b**2*d**3*x**4*sqrt(-c*
*2*x**2 + 1)*asin(c*x)/(1334025*c) - 50488*b**2*d**3*x**3/(12006225*c**2) +
 50488*b**2*d**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(4002075*c**3) - 10097
6*b**2*d**3*x/(4002075*c**4) + 100976*b**2*d**3*sqrt(-c**2*x**2 + 1)*asin(c
*x)/(4002075*c**5), Ne(c, 0)), (a**2*d**3*x**5/5, True))
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 865 vs. 2(421) = 842.
time = 0.46, size = 865, normalized size = 1.82

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/11*a^2*c^6*d^3*x^11 + 1/3*a^2*c^4*d^3*x^9 - 3/7*a^2*c^2*d^3*x^7 + 1/5*a^
2*d^3*x^5 - 1/11*(c^2*x^2 - 1)^5*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2/11*(c^2*x^
2 - 1)^5*a*b*d^3*x*arcsin(c*x)/c^4 - 4/33*(c^2*x^2 - 1)^4*b^2*d^3*x*arcsin(
c*x)^2/c^4 + 2/1331*(c^2*x^2 - 1)^5*b^2*d^3*x/c^4 - 8/33*(c^2*x^2 - 1)^4*a*
b*d^3*x*arcsin(c*x)/c^4 - 1/231*(c^2*x^2 - 1)^3*b^2*d^3*x*arcsin(c*x)^2/c^4
 - 2/121*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 + 428/3
23433*(c^2*x^2 - 1)^4*b^2*d^3*x/c^4 - 2/231*(c^2*x^2 - 1)^3*a*b*d^3*x*arcsi
n(c*x)/c^4 + 2/385*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2/121*(c^2
*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 - 8/297*(c^2*x^2 - 1)^4*sqrt(-c^
2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 - 148174/110937519*(c^2*x^2 - 1)^3*b^2*d
^3*x/c^4 + 4/385*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x)/c^4 - 8/1155*(c^2*x^
2 - 1)*b^2*d^3*x*arcsin(c*x)^2/c^4 - 8/297*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 +
1)*a*b*d^3/c^5 - 2/1617*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c
*x)/c^5 + 5487704/4622396625*(c^2*x^2 - 1)^2*b^2*d^3*x/c^4 - 16/1155*(c^2*x
```

```
^2 - 1)*a*b*d^3*x*arcsin(c*x)/c^4 + 16/1155*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2
/1617*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 + 4/1925*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 - 606416/13867189875*(c^2*x^2
 - 1)*b^2*d^3*x/c^4 + 32/1155*a*b*d^3*x*arcsin(c*x)/c^4 + 4/1925*(c^2*x^2 -
 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 + 16/3465*(-c^2*x^2 + 1)^(3/2)*b^2*d^3
*arcsin(c*x)/c^5 - 382986368/13867189875*b^2*d^3*x/c^4 + 16/3465*(-c^2*x^2
+ 1)^(3/2)*a*b*d^3/c^5 + 32/1155*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5
 + 32/1155*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.175 $\int x^3(d-c^2dx^2)^3\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=384

$$-\frac{79b^2d^3x^2}{5120c^2}-\frac{79b^2d^3x^4}{15360}+\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2560c^3}+\frac{79b}{}$$

```
[Out] -79/5120*b^2*d^3*x^2/c^2-79/15360*b^2*d^3*x^4+401/28800*b^2*c^2*d^3*x^6-57/
6400*b^2*c^4*d^3*x^8+1/500*b^2*c^6*d^3*x^10-1/32*b*c*d^3*x^5*(-c^2*x^2+1)^(
3/2)*(a+b*arcsin(c*x))-1/50*b*c*d^3*x^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x)
)-79/5120*d^3*(a+b*arcsin(c*x))^2/c^4+1/40*d^3*x^4*(a+b*arcsin(c*x))^2+1/20
*d^3*x^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+3/40*d^3*x^4*(-c^2*x^2+1)^2*(a+b*
arcsin(c*x))^2+1/10*d^3*x^4*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2+79/2560*b*d^
3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+79/3840*b*d^3*x^3*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c-31/960*b*c*d^3*x^5*(a+b*arcsin(c*x))*(-c^2*x^2+1
)^(1/2)
```

Rubi [A]
time = 1.10, antiderivative size = 384, normalized size of antiderivative = 1.00, number of steps used = 40, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}=0.333$, Rules used = {4787, 4723, 4795, 4737, 30, 4783, 14, 272, 45}

$$-\frac{79d^3(a+b\text{ArcSin}(cx))^2}{5120c^4}-\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))-\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))-\frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\text{ArcSin}(cx))^2+\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2+\frac{1}{20}d^3x^4\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2+\frac{79bd^3x^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3840c}+\frac{79bd^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2560c^3}+\frac{1}{40}d^3x^4(a+b\text{ArcSin}(cx))^2+\frac{1}{500}b^2c^6d^3x^{10}-\frac{57b^2c^4d^3x^8}{6400}+\frac{401b^2c^2d^3x^6}{28800}-\frac{79b^2d^3x^2}{5120c^2}-\frac{79b^2d^3x^4}{15360}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-79*b^2*d^3*x^2)/(5120*c^2) - (79*b^2*d^3*x^4)/15360 + (401*b^2*c^2*d^3*x^
6)/28800 - (57*b^2*c^4*d^3*x^8)/6400 + (b^2*c^6*d^3*x^10)/500 + (79*b*d^3*x
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2560*c^3) + (79*b*d^3*x^3*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(3840*c) - (31*b*c*d^3*x^5*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/960 - (b*c*d^3*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[
c*x]))/32 - (b*c*d^3*x^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/50 - (79*
d^3*(a + b*ArcSin[c*x])^2)/(5120*c^4) + (d^3*x^4*(a + b*ArcSin[c*x])^2)/40
+ (d^3*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/20 + (3*d^3*x^4*(1 - c^2*x^
2)^2*(a + b*ArcSin[c*x])^2)/40 + (d^3*x^4*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x
])^2)/10
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
```

```
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{5}(3d)\int x^3\left(d-c^2dx^2\right)^2\left(\right.$$

$$=-\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)+\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2\left(a\right.$$

$$=-\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5}$$

$$=-\frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)-\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}$$

$$=\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd^3x^3\sqrt{1-c^2x^2}\,(}{3840}$$

$$=-\frac{79b^2d^3x^4}{15360}+\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd^3}{}$$

$$=-\frac{79b^2d^3x^2}{5120c^2}-\frac{79b^2d^3x^4}{15360}+\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3$$

Mathematica [A]
time = 0.29, size = 287, normalized size = 0.75

$$-\frac{d^3\left(cx\left(28800a^2c^3x^3(-10+20c^2x^2-15c^4x^4+4c^6x^6)+30ab\sqrt{1-c^2x^2}(-1185-790c^2x^2+3208c^4x^4-2736c^6x^6+768c^8x^8)+b^2(17775cx+5925c^3x^3-16040c^5x^5+10260c^7x^7-2304c^9x^9)\right)+30b\left(bcx\sqrt{1-c^2x^2}(-1185-790c^2x^2+3208c^4x^4-2736c^6x^6+768c^8x^8)+15a(79-1280c^4x^4+2560c^6x^6-1920c^8x^8+512c^{10}x^{10})\right)\text{ArcSin}(cx)+225b^2(79-1280c^4x^4+2560c^6x^6-1920c^8x^8+512c^{10}x^{10})\text{ArcSin}(cx)^2\right)}{1152000c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/1152000*(d^3*(c*x*(28800*a^2*c^3*x^3*(-10 + 20*c^2*x^2 - 15*c^4*x^4 + 4*
c^6*x^6) + 30*a*b*Sqrt[1 - c^2*x^2]*(-1185 - 790*c^2*x^2 + 3208*c^4*x^4 - 2
736*c^6*x^6 + 768*c^8*x^8) + b^2*(17775*c*x + 5925*c^3*x^3 - 16040*c^5*x^5
+ 10260*c^7*x^7 - 2304*c^9*x^9)) + 30*b*(b*c*x*Sqrt[1 - c^2*x^2]*(-1185 - 7
90*c^2*x^2 + 3208*c^4*x^4 - 2736*c^6*x^6 + 768*c^8*x^8) + 15*a*(79 - 1280*c
^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x^10))*ArcSin[c*x] + 225*b^
2*(79 - 1280*c^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x^10)*ArcSin[
c*x]^2))/c^4
```

Maple [A]
time = 0.15, size = 519, normalized size = 1.35

method	result
derivativedivides	$-d^3a^2\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x\right.}{}\right.$
default	$-d^3a^2\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-d^3*a^2*(1/10*c^10*x^10-3/8*c^8*x^8+1/2*c^6*x^6-1/4*c^4*x^4)-d^3*b^
2*(1/8*arcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x^
2+1)^(1/2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+27
9*c*x*(-c^2*x^2+1)^(1/2)+105*arcsin(c*x))+49/5120*arcsin(c*x)^2-7/6400*(c^2
*x^2-1)^4+49/28800*(c^2*x^2-1)^3-49/15360*(c^2*x^2-1)^2+49/5120*c^2*x^2-49/
5120+1/10*arcsin(c*x)^2*(c^2*x^2-1)^5+1/6400*arcsin(c*x)*(128*c^9*x^9*(-c^2
*x^2+1)^(1/2)-656*c^7*x^7*(-c^2*x^2+1)^(1/2)+1368*c^5*x^5*(-c^2*x^2+1)^(1/2
)-1490*c^3*x^3*(-c^2*x^2+1)^(1/2)+965*c*x*(-c^2*x^2+1)^(1/2)+315*arcsin(c*x
))-1/500*(c^2*x^2-1)^5)-2*d^3*a*b*(1/10*arcsin(c*x)*c^10*x^10-3/8*arcsin(c*
x)*c^8*x^8+1/2*arcsin(c*x)*c^6*x^6-1/4*c^4*x^4*arcsin(c*x)+1/100*c^9*x^9*(-
c^2*x^2+1)^(1/2)-57/1600*c^7*x^7*(-c^2*x^2+1)^(1/2)+401/9600*c^5*x^5*(-c^2*
x^2+1)^(1/2)-79/7680*c^3*x^3*(-c^2*x^2+1)^(1/2)-79/5120*c*x*(-c^2*x^2+1)^(1
/2)+79/5120*arcsin(c*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/10*a^2*c^6*d^3*x^10 + 3/8*a^2*c^4*d^3*x^8 - 1/2*a^2*c^2*d^3*x^6 - 1/6400
*(1280*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 + 144*sqrt(-c^2*x
^2 + 1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(-c^2*x^2 + 1)*x
^3/c^8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c*x)/c^11)*c)*a*b*c^6*d
^3 + 1/512*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(
-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 +
 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*a*b*c^4*d^3 + 1/4*a^2*d^3*x^4 - 1/48*(4
8*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x
^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^2*d^3 +
 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2
+ 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*d^3 - 1/40*(4*b^2*c^6*d^3*x^10 - 15*
b^2*c^4*d^3*x^8 + 20*b^2*c^2*d^3*x^6 - 10*b^2*d^3*x^4)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2 - integrate(1/20*(4*b^2*c^7*d^3*x^10 - 15*b^2*c^5*
d^3*x^8 + 20*b^2*c^3*d^3*x^6 - 10*b^2*c*d^3*x^4)*sqrt(c*x + 1)*sqrt(-c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Fricas [A]
time = 2.04, size = 395, normalized size = 1.03

$$-\frac{2304\,(50\,a^2-b^2)c^{10}d^3x^{10} - 540\,(800\,a^2-19\,b^2)c^8d^3x^8 + 40\,(14400\,a^2-401\,b^2)c^6d^3x^6 - 75\,(3840\,a^2-79\,b^2)c^4d^3x^4 + 17775\,b^2c^2d^3x^2 + 225\,(512\,b^2c^{10}d^3x^{10} - 1920\,b^2c^8d^3x^8 + 2560\,b^2c^6d^3x^6 - 1280\,b^2c^4d^3x^4 + 79\,b^2d^3)\arcsin(cx)^2 + 450\,(512\,abc^{10}d^3x^{10} - 1920\,abc^8d^3x^8 + 2560\,abc^6d^3x^6 - 1280\,abc^4d^3x^4 + 79\,abd^3)\arcsin(cx) + 30\,(768\,abc^9d^3x^9 - 2736\,abc^7d^3x^7 + 3208\,abc^5d^3x^5 - 790\,abc^3d^3x^3 - 1185\,abcd^3x + (768\,b^2c^9d^3x^9 - 2736\,b^2c^7d^3x^7 + 3208\,b^2c^5d^3x^5 - 790\,b^2c^3d^3x^3 - 1185\,b^2cd^3x)\arcsin(cx))\sqrt{-c^2x^2+1}}{1152000\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/1152000*(2304*(50*a^2 - b^2)*c^10*d^3*x^10 - 540*(800*a^2 - 19*b^2)*c^8*
d^3*x^8 + 40*(14400*a^2 - 401*b^2)*c^6*d^3*x^6 - 75*(3840*a^2 - 79*b^2)*c^4
*d^3*x^4 + 17775*b^2*c^2*d^3*x^2 + 225*(512*b^2*c^10*d^3*x^10 - 1920*b^2*c^
8*d^3*x^8 + 2560*b^2*c^6*d^3*x^6 - 1280*b^2*c^4*d^3*x^4 + 79*b^2*d^3)*arcsi
n(c*x)^2 + 450*(512*a*b*c^10*d^3*x^10 - 1920*a*b*c^8*d^3*x^8 + 2560*a*b*c^6
*d^3*x^6 - 1280*a*b*c^4*d^3*x^4 + 79*a*b*d^3)*arcsin(c*x) + 30*(768*a*b*c^9
*d^3*x^9 - 2736*a*b*c^7*d^3*x^7 + 3208*a*b*c^5*d^3*x^5 - 790*a*b*c^3*d^3*x^
3 - 1185*a*b*c*d^3*x + (768*b^2*c^9*d^3*x^9 - 2736*b^2*c^7*d^3*x^7 + 3208*b
^2*c^5*d^3*x^5 - 790*b^2*c^3*d^3*x^3 - 1185*b^2*c*d^3*x)*arcsin(c*x))*sqrt(
-c^2*x^2 + 1))/c^4
```

Sympy [A]
time = 3.29, size = 654, normalized size = 1.70

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**10/10 + 3*a**2*c**4*d**3*x**8/8 - a**2*c**2*d
**3*x**6/2 + a**2*d**3*x**4/4 - a*b*c**6*d**3*x**10*asin(c*x)/5 - a*b*c**5*
d**3*x**9*sqrt(-c**2*x**2 + 1)/50 + 3*a*b*c**4*d**3*x**8*asin(c*x)/4 + 57*a
```

```
*b*c**3*d**3*x**7*sqrt(-c**2*x**2 + 1)/800 - a*b*c**2*d**3*x**6*asin(c*x) -
 401*a*b*c*d**3*x**5*sqrt(-c**2*x**2 + 1)/4800 + a*b*d**3*x**4*asin(c*x)/2
+ 79*a*b*d**3*x**3*sqrt(-c**2*x**2 + 1)/(3840*c) + 79*a*b*d**3*x*sqrt(-c**2
*x**2 + 1)/(2560*c**3) - 79*a*b*d**3*asin(c*x)/(2560*c**4) - b**2*c**6*d**3
*x**10*asin(c*x)**2/10 + b**2*c**6*d**3*x**10/500 - b**2*c**5*d**3*x**9*sqr
t(-c**2*x**2 + 1)*asin(c*x)/50 + 3*b**2*c**4*d**3*x**8*asin(c*x)**2/8 - 57*
b**2*c**4*d**3*x**8/6400 + 57*b**2*c**3*d**3*x**7*sqrt(-c**2*x**2 + 1)*asin
(c*x)/800 - b**2*c**2*d**3*x**6*asin(c*x)**2/2 + 401*b**2*c**2*d**3*x**6/28
800 - 401*b**2*c*d**3*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/4800 + b**2*d**3*
x**4*asin(c*x)**2/4 - 79*b**2*d**3*x**4/15360 + 79*b**2*d**3*x**3*sqrt(-c**
2*x**2 + 1)*asin(c*x)/(3840*c) - 79*b**2*d**3*x**2/(5120*c**2) + 79*b**2*d*
*3*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2560*c**3) - 79*b**2*d**3*asin(c*x)**2
/(5120*c**4), Ne(c, 0)), (a**2*d**3*x**4/4, True))
```

Giac [A]
time = 0.45, size = 631, normalized size = 1.64

$$-\frac{1}{10}a^2c^6d^3x^{10}+\frac{3}{8}a^2c^4d^3x^8-\frac{1}{2}a^2c^2d^3x^6+\frac{1}{4}a^2d^3x^4-\frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}\,b^2d^3x\arcsin(cx)}{50\,c^3}-\frac{(c^2x^2-1)^5b^2d^3\arcsin(cx)^2}{10\,c^4}-\frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}\,abd^3x}{50\,c^3}-\frac{7\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,b^2d^3x\arcsin(cx)}{800\,c^3}-\frac{(c^2x^2-1)^5abd^3\arcsin(cx)}{5\,c^4}-\frac{(c^2x^2-1)^4b^2d^3\arcsin(cx)^2}{8\,c^4}-\frac{7\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,abd^3x}{800\,c^3}+\frac{49\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,b^2d^3x\arcsin(cx)}{4800\,c^3}+\frac{(c^2x^2-1)^5b^2d^3}{500\,c^4}-\frac{(c^2x^2-1)^4abd^3\arcsin(cx)}{4\,c^4}+\frac{49\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,abd^3x}{4800\,c^3}+\frac{49\,(-c^2x^2+1)^{\frac{3}{2}}b^2d^3x\arcsin(cx)}{3840\,c^3}+\frac{7\,(c^2x^2-1)^4b^2d^3}{6400\,c^4}+\frac{49\,(-c^2x^2+1)^{\frac{3}{2}}abd^3x}{3840\,c^3}+\frac{49\,\sqrt{-c^2x^2+1}\,b^2d^3x\arcsin(cx)}{2560\,c^3}-\frac{49\,(c^2x^2-1)^3b^2d^3}{28800\,c^4}+\frac{49\,\sqrt{-c^2x^2+1}\,abd^3x}{2560\,c^3}+\frac{49\,(c^2x^2-1)^2b^2d^3}{15360\,c^4}+\frac{49\,b^2d^3\arcsin(cx)^2}{5120\,c^4}-\frac{49\,(c^2x^2-1)b^2d^3}{5120\,c^4}+\frac{49\,abd^3\arcsin(cx)}{2560\,c^4}-\frac{232981\,b^2d^3}{36864000\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/10*a^2*c^6*d^3*x^10 + 3/8*a^2*c^4*d^3*x^8 - 1/2*a^2*c^2*d^3*x^6 + 1/4*a^
2*d^3*x^4 - 1/50*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c
^3 - 1/10*(c^2*x^2 - 1)^5*b^2*d^3*arcsin(c*x)^2/c^4 - 1/50*(c^2*x^2 - 1)^4*
sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c^3 - 7/800*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)
*b^2*d^3*x*arcsin(c*x)/c^3 - 1/5*(c^2*x^2 - 1)^5*a*b*d^3*arcsin(c*x)/c^4 -
1/8*(c^2*x^2 - 1)^4*b^2*d^3*arcsin(c*x)^2/c^4 - 7/800*(c^2*x^2 - 1)^3*sqrt(
-c^2*x^2 + 1)*a*b*d^3*x/c^3 + 49/4800*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^
2*d^3*x*arcsin(c*x)/c^3 + 1/500*(c^2*x^2 - 1)^5*b^2*d^3/c^4 - 1/4*(c^2*x^2
- 1)^4*a*b*d^3*arcsin(c*x)/c^4 + 49/4800*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)
*a*b*d^3*x/c^3 + 49/3840*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*x*arcsin(c*x)/c^3 + 7
/6400*(c^2*x^2 - 1)^4*b^2*d^3/c^4 + 49/3840*(-c^2*x^2 + 1)^(3/2)*a*b*d^3*x/
c^3 + 49/2560*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c^3 - 49/28800*(c^2*
x^2 - 1)^3*b^2*d^3/c^4 + 49/2560*sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c^3 + 49/1536
0*(c^2*x^2 - 1)^2*b^2*d^3/c^4 + 49/5120*b^2*d^3*arcsin(c*x)^2/c^4 - 49/5120
*(c^2*x^2 - 1)*b^2*d^3/c^4 + 49/2560*a*b*d^3*arcsin(c*x)/c^4 - 232981/36864
000*b^2*d^3/c^4
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.176 $\int x^2(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=391

$$-\frac{10516b^2d^3x}{99225c^2}-\frac{5258b^2d^3x^3}{297675}+\frac{4198b^2c^2d^3x^5}{165375}-\frac{374b^2c^4d^3x^7}{27783}+\frac{2}{729}b^2c^6d^3x^9+\frac{64bd^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx)}{945c^3}$$

```
[Out] -10516/99225*b^2*d^3*x/c^2-5258/297675*b^2*d^3*x^3+4198/165375*b^2*c^2*d^3*
x^5-374/27783*b^2*c^4*d^3*x^7+2/729*b^2*c^6*d^3*x^9+16/315*b*d^3*(-c^2*x^2+
1)^(3/2)*(a+b*arcsin(c*x))/c^3+4/525*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c
*x))/c^3+2/441*b*d^3*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c*x))/c^3-2/81*b*d^3*(-
c^2*x^2+1)^(9/2)*(a+b*arcsin(c*x))/c^3+16/315*d^3*x^3*(a+b*arcsin(c*x))^2+8
/105*d^3*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+2/21*d^3*x^3*(-c^2*x^2+1)^2*(
a+b*arcsin(c*x))^2+1/9*d^3*x^3*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2+64/945*b*
d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+32/945*b*d^3*x^2*(a+b*arcsin(c
*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.57, antiderivative size = 391, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 380}

$$\frac{32bd^3x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{945c}+\frac{1}{9}d^3x^3(1-c^2x^2)^3(a+b\text{ArcSin}(cx))^2+\frac{2}{21}d^3x^3(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2+\frac{8}{105}d^3x^3(1-c^2x^2)(a+b\text{ArcSin}(cx))^2-\frac{2bd^3(1-c^2x^2)^{9/2}(a+b\text{ArcSin}(cx))}{81c^3}+\frac{2bd^3(1-c^2x^2)^{7/2}(a+b\text{ArcSin}(cx))}{441c^3}+\frac{4bd^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{525c^3}+\frac{16bd^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{315c^3}+\frac{64bd^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{945c^3}+\frac{16}{315}d^3x^3(a+b\text{ArcSin}(cx))^2+\frac{2}{729}b^2c^6d^3x^9-\frac{374b^2c^4d^3x^7}{27783}+\frac{4198b^2c^2d^3x^5}{165375}-\frac{10516b^2d^3x}{99225c^2}-\frac{5258b^2d^3x^3}{297675}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-10516*b^2*d^3*x)/(99225*c^2) - (5258*b^2*d^3*x^3)/297675 + (4198*b^2*c^2*
d^3*x^5)/165375 - (374*b^2*c^4*d^3*x^7)/27783 + (2*b^2*c^6*d^3*x^9)/729 + (
64*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c^3) + (32*b*d^3*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c) + (16*b*d^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x]))/(315*c^3) + (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x]))/(525*c^3) + (2*b*d^3*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(4
41*c^3) - (2*b*d^3*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^3) + (16*
d^3*x^3*(a + b*ArcSin[c*x])^2)/315 + (8*d^3*x^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/105 + (2*d^3*x^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/21 + (d^3
*x^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/9
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
```

```
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}(2d)\int x^2\left(d-c^2dx^2\right)^2\left(\right.$$

$$=\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{63c^3}-\frac{2bd^3\left(1-c^2x^2\right)^{9/2}\left(a+b\sin\right.}{81c^3}$$

$$=\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{105c^3}+\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin\right.}{441c^3}$$

$$=\frac{16bd^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{315c^3}+\frac{4bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\,\mathrm{s}\right.}{525c^3}$$

$$=-\frac{4b^2d^3x}{567c^2}-\frac{2b^2d^3x^3}{1701}+\frac{2}{189}b^2c^2d^3x^5-\frac{38b^2c^4d^3x^7}{3969}+\frac{2}{729}b^2c^6d^3x^9$$

$$=-\frac{3796b^2d^3x}{99225c^2}-\frac{5258b^2d^3x^3}{297675}+\frac{4198b^2c^2d^3x^5}{165375}-\frac{374b^2c^4d^3x^7}{27783}+\frac{2}{72}$$

$$=-\frac{10516b^2d^3x}{99225c^2}-\frac{5258b^2d^3x^3}{297675}+\frac{4198b^2c^2d^3x^5}{165375}-\frac{374b^2c^4d^3x^7}{27783}+\frac{}{7}$$

Mathematica [A]
time = 0.25, size = 277, normalized size = 0.71

$$-\frac{d^3\left(99225a^2c^3x^3(-105+189c^2x^2-135c^4x^4+35c^6x^6)+630ab\sqrt{1-c^2x^2}\,(-5258-2629c^2x^2+6297c^4x^4-4675c^6x^6+1225c^8x^8)+b^2(3312540cx+552090c^3x^3-793422c^5x^5+420750c^7x^7-85750c^9x^9)+630b\left(315ac^3x^3(-105+189c^2x^2-135c^4x^4+35c^6x^6)+b\sqrt{1-c^2x^2}\,(-5258-2629c^2x^2+6297c^4x^4-4675c^6x^6+1225c^8x^8)\right)\mathrm{ArcSin}(cx)+99225b^2c^3x^3(-105+189c^2x^2-135c^4x^4+35c^6x^6)\,\mathrm{ArcSin}(cx)^2\right)}{31255875c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/31255875*(d^3*(99225*a^2*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*
c^6*x^6) + 630*a*b*Sqrt[1 - c^2*x^2]*(-5258 - 2629*c^2*x^2 + 6297*c^4*x^4 -
 4675*c^6*x^6 + 1225*c^8*x^8) + b^2*(3312540*c*x + 552090*c^3*x^3 - 793422*
c^5*x^5 + 420750*c^7*x^7 - 85750*c^9*x^9) + 630*b*(315*a*c^3*x^3*(-105 + 18
9*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-5258 - 2629*c
^2*x^2 + 6297*c^4*x^4 - 4675*c^6*x^6 + 1225*c^8*x^8))*ArcSin[c*x] + 99225*b
^2*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6)*ArcSin[c*x]^2))/
c^3
```

Maple [A]
time = 0.09, size = 525, normalized size = 1.34

method	result
derivativedivides	$\frac{-d^3a^2\left(\frac{1}{9}c^9x^9-\frac{3}{7}c^7x^7+\frac{3}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x}}{441}\right.}{}$
default	$\frac{-d^3a^2\left(\frac{1}{9}c^9x^9-\frac{3}{7}c^7x^7+\frac{3}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x}}{441}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-d^3*a^2*(1/9*c^9*x^9-3/7*c^7*x^7+3/5*c^5*x^5-1/3*c^3*x^3)-d^3*b^2*(
1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+2/441*arcsin(c*
x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/15435*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^
2-35)*c*x-4/525*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)+4/7875*(3*c^4*
x^4-10*c^2*x^2+15)*c*x+16/945*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-16
/2835*(c^2*x^2-3)*c*x+32/315*c*x-32/315*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/31
5*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x+2/
81*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)^(1/2)-2/25515*(35*c^8*x^8-180*c^6
*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x)-2*d^3*a*b*(1/9*arcsin(c*x)*c^9*x^9-3
/7*arcsin(c*x)*c^7*x^7+3/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^3*arcsin(c*x)+1/81
*c^8*x^8*(-c^2*x^2+1)^(1/2)-187/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+2099/33075*
c^4*x^4*(-c^2*x^2+1)^(1/2)-2629/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)-5258/99225
*(-c^2*x^2+1)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 946 vs. $2(346) = 692$.
time = 0.52, size = 946, normalized size = 2.42

$$-\frac{1}{9}b^2c^6d^3x^9\arcsin(cx)^2-\frac{1}{9}a^2c^6d^3x^9+\frac{3}{7}b^2c^4d^3x^7\arcsin(cx)^2+\frac{3}{7}a^2c^4d^3x^7-\frac{3}{5}b^2c^2d^3x^5\arcsin(cx)^2-\frac{2}{2835}\left(315x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}\,x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}\,x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}\,x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}\,x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right)abc^6d^3-\frac{2}{893025}\left(315\left(\frac{35\sqrt{-c^2x^2+1}\,x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}\,x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}\,x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}\,x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\arcsin(cx)-\frac{1225c^8x^9+1800c^6x^7+3024c^4x^5+6720c^2x^3+40320x}{c^8}\right)b^2c^6d^3-\frac{3}{5}a^2c^2d^3x^5+\frac{6}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)abc^4d^3+\frac{2}{8575}\left(105\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin(cx)-\frac{75c^6x^7+126c^4x^5+280c^2x^3+1680x}{c^6}\right)b^2c^4d^3+\frac{1}{3}b^2d^3x^3\arcsin(cx)^2-\frac{2}{25}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^2d^3-\frac{2}{375}\left(15\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx)-\frac{9c^4x^5+20c^2x^3+120x}{c^4}\right)b^2c^2d^3+\frac{1}{3}a^2d^3x^3+\frac{2}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abd^3+\frac{2}{27}\left(3c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx)-\frac{c^2x^3+6x}{c^2}\right)b^2d^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/9*b^2*c^6*d^3*x^9*arcsin(c*x)^2 - 1/9*a^2*c^6*d^3*x^9 + 3/7*b^2*c^4*d^3*
x^7*arcsin(c*x)^2 + 3/7*a^2*c^4*d^3*x^7 - 3/5*b^2*c^2*d^3*x^5*arcsin(c*x)^2
 - 2/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-
c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1
)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*a*b*c^6*d^3 - 2/893025*(315*(35
*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*
x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c
^10)*c*arcsin(c*x) - (1225*c^8*x^9 + 1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2
*x^3 + 40320*x)/c^8)*b^2*c^6*d^3 - 3/5*a^2*c^2*d^3*x^5 + 6/245*(35*x^7*arcs
in(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*
sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^4*d^3 + 2/
8575*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*
sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75
*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^4*d^3 + 1/3*b^2*d
^3*x^3*arcsin(c*x)^2 - 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4
/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*
d^3 - 2/375*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^
4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120
*x)/c^4)*b^2*c^2*d^3 + 1/3*a^2*d^3*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-
c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^3 + 2/27*(3*c*(sqrt
(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 +
 6*x)/c^2)*b^2*d^3
```

Fricas [A]
time = 1.39, size = 372, normalized size = 0.95

$$-\frac{42875\left(81a^2-2b^2\right)c^9d^3x^9-1125\left(11907a^2-374b^2\right)c^7d^3x^7+189\left(99225a^2-4198b^2\right)c^5d^3x^5-105\left(99225a^2-5258b^2\right)c^3d^3x^3+3312540b^2cd^3x+99225\left(35b^2c^9d^3x^9-135b^2c^7d^3x^7+189b^2c^5d^3x^5-105b^2c^3d^3x^3\right)\arcsin(cx)^2+198450\left(35abc^9d^3x^9-135abc^7d^3x^7+189abc^5d^3x^5-105abc^3d^3x^3\right)\arcsin(cx)+630\left(1225abc^8d^3x^8-4675abc^6d^3x^6+6297abc^4d^3x^4-2629abc^2d^3x^2-5258abd^3+\left(1225b^2c^8d^3x^8-4675b^2c^6d^3x^6+6297b^2c^4d^3x^4-2629b^2c^2d^3x^2-5258b^2d^3\right)\arcsin(cx)\right)\sqrt{-c^2x^2+1}}{31255875c^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/31255875*(42875*(81*a^2 - 2*b^2)*c^9*d^3*x^9 - 1125*(11907*a^2 - 374*b^2
)*c^7*d^3*x^7 + 189*(99225*a^2 - 4198*b^2)*c^5*d^3*x^5 - 105*(99225*a^2 - 5
258*b^2)*c^3*d^3*x^3 + 3312540*b^2*c*d^3*x + 99225*(35*b^2*c^9*d^3*x^9 - 13
5*b^2*c^7*d^3*x^7 + 189*b^2*c^5*d^3*x^5 - 105*b^2*c^3*d^3*x^3)*arcsin(c*x)^
2 + 198450*(35*a*b*c^9*d^3*x^9 - 135*a*b*c^7*d^3*x^7 + 189*a*b*c^5*d^3*x^5
```

```
- 105*a*b*c^3*d^3*x^3)*arcsin(c*x) + 630*(1225*a*b*c^8*d^3*x^8 - 4675*a*b*c
^6*d^3*x^6 + 6297*a*b*c^4*d^3*x^4 - 2629*a*b*c^2*d^3*x^2 - 5258*a*b*d^3 + (
1225*b^2*c^8*d^3*x^8 - 4675*b^2*c^6*d^3*x^6 + 6297*b^2*c^4*d^3*x^4 - 2629*b
^2*c^2*d^3*x^2 - 5258*b^2*d^3)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A]
time = 2.25, size = 626, normalized size = 1.60

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**9/9 + 3*a**2*c**4*d**3*x**7/7 - 3*a**2*c**2*d
**3*x**5/5 + a**2*d**3*x**3/3 - 2*a*b*c**6*d**3*x**9*asin(c*x)/9 - 2*a*b*c*
*5*d**3*x**8*sqrt(-c**2*x**2 + 1)/81 + 6*a*b*c**4*d**3*x**7*asin(c*x)/7 + 3
74*a*b*c**3*d**3*x**6*sqrt(-c**2*x**2 + 1)/3969 - 6*a*b*c**2*d**3*x**5*asin
(c*x)/5 - 4198*a*b*c*d**3*x**4*sqrt(-c**2*x**2 + 1)/33075 + 2*a*b*d**3*x**3
*asin(c*x)/3 + 5258*a*b*d**3*x**2*sqrt(-c**2*x**2 + 1)/(99225*c) + 10516*a*
b*d**3*sqrt(-c**2*x**2 + 1)/(99225*c**3) - b**2*c**6*d**3*x**9*asin(c*x)**2
/9 + 2*b**2*c**6*d**3*x**9/729 - 2*b**2*c**5*d**3*x**8*sqrt(-c**2*x**2 + 1)
*asin(c*x)/81 + 3*b**2*c**4*d**3*x**7*asin(c*x)**2/7 - 374*b**2*c**4*d**3*x
**7/27783 + 374*b**2*c**3*d**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/3969 - 3
*b**2*c**2*d**3*x**5*asin(c*x)**2/5 + 4198*b**2*c**2*d**3*x**5/165375 - 419
8*b**2*c*d**3*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/33075 + b**2*d**3*x**3*as
in(c*x)**2/3 - 5258*b**2*d**3*x**3/297675 + 5258*b**2*d**3*x**2*sqrt(-c**2*
x**2 + 1)*asin(c*x)/(99225*c) - 10516*b**2*d**3*x/(99225*c**2) + 10516*b**2
*d**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(99225*c**3), Ne(c, 0)), (a**2*d**3*x*
*3/3, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 716 vs. 2(346) = 692.
time = 0.45, size = 716, normalized size = 1.83

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/9*a^2*c^6*d^3*x^9 + 3/7*a^2*c^4*d^3*x^7 - 3/5*a^2*c^2*d^3*x^5 - 1/9*(c^2
*x^2 - 1)^4*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/9*(c^2*x^2 - 1)^4*a*b*d^3*x*arc
sin(c*x)/c^2 - 1/63*(c^2*x^2 - 1)^3*b^2*d^3*x*arcsin(c*x)^2/c^2 + 2/729*(c^
2*x^2 - 1)^4*b^2*d^3*x/c^2 + 1/3*a^2*d^3*x^3 - 2/63*(c^2*x^2 - 1)^3*a*b*d^3
*x*arcsin(c*x)/c^2 + 2/105*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/
81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 - 622/250047*
(c^2*x^2 - 1)^3*b^2*d^3*x/c^2 + 4/105*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x)
```

```
/c^2 - 8/315*(c^2*x^2 - 1)*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/81*(c^2*x^2 - 1)
^4*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 - 2/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1
)*b^2*d^3*arcsin(c*x)/c^3 + 15224/10418625*(c^2*x^2 - 1)^2*b^2*d^3*x/c^2 -
16/315*(c^2*x^2 - 1)*a*b*d^3*x*arcsin(c*x)/c^2 + 16/315*b^2*d^3*x*arcsin(c*
x)^2/c^2 - 2/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 + 4/525*(c^
2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 + 115504/31255875*(
c^2*x^2 - 1)*b^2*d^3*x/c^2 + 32/315*a*b*d^3*x*arcsin(c*x)/c^2 + 4/525*(c^2*
x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 + 16/945*(-c^2*x^2 + 1)^(3/2)*b^2
*d^3*arcsin(c*x)/c^3 - 3406208/31255875*b^2*d^3*x/c^2 + 16/945*(-c^2*x^2 +
1)^(3/2)*a*b*d^3/c^3 + 32/315*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 +
32/315*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2 (a + b\,\mathrm{asin}(c\,x))^2 \left(d - c^2\,d\,x^2\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.177 $\int x(d-c^2dx^2)^3(a+b\textbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=268

$$-\frac{175b^2d^3x^2}{3072}+\frac{35b^2c^2d^3x^4}{3072}+\frac{7b^2d^3(1-c^2x^2)^3}{1152c^2}+\frac{b^2d^3(1-c^2x^2)^4}{256c^2}+\frac{35bd^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{512c}+\frac{35bd^3x}{}$$

```
[Out] -175/3072*b^2*d^3*x^2+35/3072*b^2*c^2*d^3*x^4+7/1152*b^2*d^3*(-c^2*x^2+1)^3
/c^2+1/256*b^2*d^3*(-c^2*x^2+1)^4/c^2+35/768*b*d^3*x*(-c^2*x^2+1)^(3/2)*(a+
b*arcsin(c*x))/c+7/192*b*d^3*x*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c+1/32*
b*d^3*x*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c*x))/c+35/1024*d^3*(a+b*arcsin(c*x)
)^2/c^2-1/8*d^3*(-c^2*x^2+1)^4*(a+b*arcsin(c*x))^2/c^2+35/512*b*d^3*x*(a+b*
arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.17, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4767, 4743, 4741, 4737, 30, 14, 267}

$$\frac{bd^3x(1-c^2x^2)^{7/2}(a+b\text{ArcSin}(cx))}{32c}+\frac{7bd^3x(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{192c}+\frac{35bd^3x(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{768c}+\frac{35bd^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{512c}-\frac{d^3(1-c^2x^2)^4(a+b\text{ArcSin}(cx))^2}{8c^2}+\frac{35d^3(a+b\text{ArcSin}(cx))^2}{1024c^2}+\frac{35b^2c^2d^3x^4}{3072}+\frac{b^2d^3(1-c^2x^2)^4}{256c^2}+\frac{7b^2d^3(1-c^2x^2)^3}{1152c^2}-\frac{175b^2d^3x^2}{3072}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-175*b^2*d^3*x^2)/3072 + (35*b^2*c^2*d^3*x^4)/3072 + (7*b^2*d^3*(1 - c^2*x
^2)^3)/(1152*c^2) + (b^2*d^3*(1 - c^2*x^2)^4)/(256*c^2) + (35*b*d^3*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(512*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2)
*(a + b*ArcSin[c*x]))/(768*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSi
n[c*x]))/(192*c) + (b*d^3*x*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(32*c)
 + (35*d^3*(a + b*ArcSin[c*x])^2)/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(a + b*
ArcSin[c*x])^2)/(8*c^2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
 NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2\,dx = -\frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}(cx)\right)^2}{8c^2}+\frac{(bd^3)\int(1-c^2x^2)^{7/2}\left(a+b\sin\right.}{4c}$$

$$=\frac{bd^3x(1-c^2x^2)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{32c}-\frac{d^3(1-c^2x^2)^4\left(a+b\sin^{-1}(cx\right.}{8c^2}$$

$$=\frac{b^2d^3(1-c^2x^2)^4}{256c^2}+\frac{7bd^3x(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{192c}+\frac{bd^3x(1-}{}$$

$$=\frac{7b^2d^3(1-c^2x^2)^3}{1152c^2}+\frac{b^2d^3(1-c^2x^2)^4}{256c^2}+\frac{35bd^3x(1-c^2x^2)^{3/2}\left(a+b\,\mathrm{si}\right.}{768c}$$

$$=\frac{7b^2d^3(1-c^2x^2)^3}{1152c^2}+\frac{b^2d^3(1-c^2x^2)^4}{256c^2}+\frac{35bd^3x\sqrt{1-c^2x^2}\left(a+b\sin\right.}{512c}$$

$$=-\frac{175b^2d^3x^2}{3072}+\frac{35b^2c^2d^3x^4}{3072}+\frac{7b^2d^3(1-c^2x^2)^3}{1152c^2}+\frac{b^2d^3(1-c^2x^2)^4}{256c^2}+$$

Mathematica [A]

time = 0.20, size = 257, normalized size = 0.96

$$-\frac{d^3\left(cx\left(b^2cx(837-489c^2x^2+200c^4x^4-36c^6x^6)+1152a^2cx(-4+6c^2x^2-4c^4x^4+c^6x^6)+6ab\sqrt{1-c^2x^2}(-279+326c^2x^2-200c^4x^4+48c^6x^6)\right)+6b\left(bcx\sqrt{1-c^2x^2}(-279+326c^2x^2-200c^4x^4+48c^6x^6)+3a(93-512c^2x^2+768c^4x^4-512c^6x^6+128c^8x^8)\right)\mathrm{ArcSin}(cx)+9b^2(93-512c^2x^2+768c^4x^4-512c^6x^6+128c^8x^8)\,\mathrm{ArcSin}(cx)^2\right)}{9216c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/9216*(d^3*(c*x*(b^2*c*x*(837 - 489*c^2*x^2 + 200*c^4*x^4 - 36*c^6*x^6) +
 1152*a^2*c*x*(-4 + 6*c^2*x^2 - 4*c^4*x^4 + c^6*x^6) + 6*a*b*Sqrt[1 - c^2*x
^2]*(-279 + 326*c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6)) + 6*b*(b*c*x*Sqrt[1 -
c^2*x^2]*(-279 + 326*c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6) + 3*a*(93 - 512*c^
2*x^2 + 768*c^4*x^4 - 512*c^6*x^6 + 128*c^8*x^8))*ArcSin[c*x] + 9*b^2*(93 -
 512*c^2*x^2 + 768*c^4*x^4 - 512*c^6*x^6 + 128*c^8*x^8)*ArcSin[c*x]^2))/c^2
```

Maple [A]

time = 0.08, size = 336, normalized size = 1.25

method	result
derivativedivides	$-\frac{d^3\left(c^2x^2-1\right)^4a^2}{8}-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x^5\sqrt{-c^2x^2+1}-326c^3x\right.}{1536}\right.$
default	$-\frac{d^3\left(c^2x^2-1\right)^4a^2}{8}-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x^5\sqrt{-c^2x^2+1}-326c^3x\right.}{1536}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/8*d^3*(c^2*x^2-1)^4*a^2-d^3*b^2*(1/8*arcsin(c*x)^2*(c^2*x^2-1)^4-
1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x^2+1)^(1/2)+200*c^5*x^5*(-c^2*x^2+1)
^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+279*c*x*(-c^2*x^2+1)^(1/2)+105*arcsin
(c*x))+35/1024*arcsin(c*x)^2-1/256*(c^2*x^2-1)^4+7/1152*(c^2*x^2-1)^3-35/30
72*(c^2*x^2-1)^2+35/1024*c^2*x^2-35/1024)-2*d^3*a*b*(1/8*arcsin(c*x)*c^8*x^
8-1/2*arcsin(c*x)*c^6*x^6+3/4*c^4*x^4*arcsin(c*x)-1/2*c^2*x^2*arcsin(c*x)+9
3/1024*arcsin(c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(1/2)-25/384*c^5*x^5*(-c^2*x^2
+1)^(1/2)+163/1536*c^3*x^3*(-c^2*x^2+1)^(1/2)-93/1024*c*x*(-c^2*x^2+1)^(1/2
)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/8*a^2*c^6*d^3*x^8 + 1/2*a^2*c^4*d^3*x^6 - 1/1536*(384*x^8*arcsin(c*x) +
(48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c
^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c
)*a*b*c^6*d^3 - 3/4*a^2*c^2*d^3*x^4 + 1/48*(48*x^6*arcsin(c*x) + (8*sqrt(-c
^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)
*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^4*d^3 - 3/16*(8*x^4*arcsin(c*x) + (2*
sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5
)*c)*a*b*c^2*d^3 + 1/2*a^2*d^3*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*
x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d^3 - 1/8*(b^2*c^6*d^3*x^8 - 4*b^2*c
^4*d^3*x^6 + 6*b^2*c^2*d^3*x^4 - 4*b^2*d^3*x^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 - integrate(1/4*(b^2*c^7*d^3*x^8 - 4*b^2*c^5*d^3*x^6 + 6*
b^2*c^3*d^3*x^4 - 4*b^2*c*d^3*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Fricas [A]
time = 4.84, size = 354, normalized size = 1.32

$$-\frac{36\,(32\,a^{2}-b^{2})c^{8}d^{3}x^{8}-8\,(576\,a^{2}-25\,b^{2})c^{6}d^{3}x^{6}+3\,(2304\,a^{2}-163\,b^{2})c^{4}d^{3}x^{4}-9\,(512\,a^{2}-93\,b^{2})c^{2}d^{3}x^{2}+9\,(128\,b^{2}c^{8}d^{3}x^{8}-512\,b^{2}c^{6}d^{3}x^{6}+768\,b^{2}c^{4}d^{3}x^{4}-512\,b^{2}c^{2}d^{3}x^{2}+93\,b^{2}d^{3})\arcsin\left(cx\right)^{2}+18\,(128\,abc^{8}d^{3}x^{8}-512\,abc^{6}d^{3}x^{6}+768\,abc^{4}d^{3}x^{4}-512\,abc^{2}d^{3}x^{2}+93\,abd^{3})\arcsin\left(cx\right)+6\,(48\,abc^{7}d^{3}x^{7}-200\,abc^{5}d^{3}x^{5}+326\,abc^{3}d^{3}x^{3}-279\,abcd^{3}x+(48\,b^{2}c^{7}d^{3}x^{7}-200\,b^{2}c^{5}d^{3}x^{5}+326\,b^{2}c^{3}d^{3}x^{3}-279\,b^{2}cd^{3}x)\arcsin\left(cx\right))\sqrt{-c^{2}x^{2}+1}}{9216\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/9216*(36*(32*a^2 - b^2)*c^8*d^3*x^8 - 8*(576*a^2 - 25*b^2)*c^6*d^3*x^6 +
 3*(2304*a^2 - 163*b^2)*c^4*d^3*x^4 - 9*(512*a^2 - 93*b^2)*c^2*d^3*x^2 + 9*
(128*b^2*c^8*d^3*x^8 - 512*b^2*c^6*d^3*x^6 + 768*b^2*c^4*d^3*x^4 - 512*b^2*
c^2*d^3*x^2 + 93*b^2*d^3)*arcsin(c*x)^2 + 18*(128*a*b*c^8*d^3*x^8 - 512*a*b
*c^6*d^3*x^6 + 768*a*b*c^4*d^3*x^4 - 512*a*b*c^2*d^3*x^2 + 93*a*b*d^3)*arcs
in(c*x) + 6*(48*a*b*c^7*d^3*x^7 - 200*a*b*c^5*d^3*x^5 + 326*a*b*c^3*d^3*x^3
 - 279*a*b*c*d^3*x + (48*b^2*c^7*d^3*x^7 - 200*b^2*c^5*d^3*x^5 + 326*b^2*c^
3*d^3*x^3 - 279*b^2*c*d^3*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

<u>**Sympy**</u> [**B**] Leaf count of result is larger than twice the leaf count of optimal. 573 vs. $2(252) = 504$.
time = 1.77, size = 573, normalized size = 2.14

$$\begin{cases} -\frac{a^2c^6d^3x^8}{8} + \frac{a^2c^4d^3x^6}{2} - \frac{3a^2c^2d^3x^4}{4} + \frac{a^2d^3x^2}{2} - \frac{abc^6d^3x^8\operatorname{asin}(cx)}{4} - \frac{abc^5d^3x^7\sqrt{-c^2x^2+1}}{32} + abc^4d^3x^6\operatorname{asin}(cx) + \frac{25abc^3d^3x^5\sqrt{-c^2x^2+1}}{192} - \frac{3abc^2d^3x^4\operatorname{asin}(cx)}{2} - \frac{163abcd^3x^3\sqrt{-c^2x^2+1}}{768} + abd^3x^2\operatorname{asin}(cx) + \frac{93abd^3x\sqrt{-c^2x^2+1}}{512c} - \frac{93abd^3\operatorname{asin}(cx)}{512c^2} - \frac{b^2c^6d^3x^8\operatorname{asin}^2(cx)}{8} + \frac{b^2c^6d^3x^8}{256} - \frac{b^2c^5d^3x^7\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{32} + \frac{b^2c^4d^3x^6\operatorname{asin}^2(cx)}{2} - \frac{25b^2c^4d^3x^6}{1152} + \frac{25b^2c^3d^3x^5\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{192} - \frac{3b^2c^2d^3x^4\operatorname{asin}^2(cx)}{4} + \frac{163b^2c^2d^3x^4}{3072} - \frac{163b^2cd^3x^3\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{768} + \frac{b^2d^3x^2\operatorname{asin}^2(cx)}{2} - \frac{93b^2d^3x^2}{1024} + \frac{93b^2d^3x\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{512c} - \frac{93b^2d^3\operatorname{asin}^2(cx)}{1024c^2} & \text{for}\: c \neq 0 \\ \frac{a^2d^3x^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**8/8 + a**2*c**4*d**3*x**6/2 - 3*a**2*c**2*d**
3*x**4/4 + a**2*d**3*x**2/2 - a*b*c**6*d**3*x**8*asin(c*x)/4 - a*b*c**5*d**
3*x**7*sqrt(-c**2*x**2 + 1)/32 + a*b*c**4*d**3*x**6*asin(c*x) + 25*a*b*c**3
*d**3*x**5*sqrt(-c**2*x**2 + 1)/192 - 3*a*b*c**2*d**3*x**4*asin(c*x)/2 - 16
3*a*b*c*d**3*x**3*sqrt(-c**2*x**2 + 1)/768 + a*b*d**3*x**2*asin(c*x) + 93*a
*b*d**3*x*sqrt(-c**2*x**2 + 1)/(512*c) - 93*a*b*d**3*asin(c*x)/(512*c**2) -
 b**2*c**6*d**3*x**8*asin(c*x)**2/8 + b**2*c**6*d**3*x**8/256 - b**2*c**5*d
**3*x**7*sqrt(-c**2*x**2 + 1)*asin(c*x)/32 + b**2*c**4*d**3*x**6*asin(c*x)*
*2/2 - 25*b**2*c**4*d**3*x**6/1152 + 25*b**2*c**3*d**3*x**5*sqrt(-c**2*x**2
 + 1)*asin(c*x)/192 - 3*b**2*c**2*d**3*x**4*asin(c*x)**2/4 + 163*b**2*c**2*
d**3*x**4/3072 - 163*b**2*c*d**3*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/768 +
b**2*d**3*x**2*asin(c*x)**2/2 - 93*b**2*d**3*x**2/1024 + 93*b**2*d**3*x*sqr
t(-c**2*x**2 + 1)*asin(c*x)/(512*c) - 93*b**2*d**3*asin(c*x)**2/(1024*c**2)
, Ne(c, 0)), (a**2*d**3*x**2/2, True))
```

<u>**Giac**</u> [**B**] Leaf count of result is larger than twice the leaf count of optimal. 492 vs. $2(237) = 474$.
time = 0.45, size = 492, normalized size = 1.84

$$-\frac{1}{8}a^2c^6d^3x^8 + \frac{1}{2}a^2c^4d^3x^6 - \frac{3}{4}a^2c^2d^3x^4 - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,b^2d^3x\arcsin(cx)}{32\,c} - \frac{(c^2x^2-1)^4b^2d^3\arcsin(cx)^2}{8\,c^2} - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,abd^3x}{32\,c} + \frac{7\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,b^2d^3x\arcsin(cx)}{192\,c} - \frac{(c^2x^2-1)^4abd^3\arcsin(cx)}{4\,c^2} + \frac{7\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,abd^3x}{192\,c} + \frac{35\,(-c^2x^2+1)^{\frac{3}{2}}b^2d^3x\arcsin(cx)}{768\,c} + \frac{(c^2x^2-1)^4b^2d^3}{256\,c^2} + \frac{35\,(-c^2x^2+1)^{\frac{3}{2}}abd^3x}{768\,c} + \frac{35\,\sqrt{-c^2x^2+1}\,b^2d^3x\arcsin(cx)}{512\,c} - \frac{7\,(c^2x^2-1)^3b^2d^3}{1152\,c^2} + \frac{35\,\sqrt{-c^2x^2+1}\,abd^3x}{512\,c} + \frac{35\,(c^2x^2-1)^2b^2d^3}{3072\,c^2} + \frac{35\,b^2d^3\arcsin(cx)^2}{1024\,c^2} + \frac{(c^2x^2-1)a^2d^3}{2\,c^2} - \frac{35\,(c^2x^2-1)b^2d^3}{1024\,c^2} + \frac{35\,abd^3\arcsin(cx)}{512\,c^2} - \frac{7175\,b^2d^3}{294912\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/8*a^2*c^6*d^3*x^8 + 1/2*a^2*c^4*d^3*x^6 - 3/4*a^2*c^2*d^3*x^4 - 1/32*(c^
2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c - 1/8*(c^2*x^2 - 1)
^4*b^2*d^3*arcsin(c*x)^2/c^2 - 1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*
d^3*x/c + 7/192*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c
```

```
- 1/4*(c^2*x^2 - 1)^4*a*b*d^3*arcsin(c*x)/c^2 + 7/192*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*a*b*d^3*x/c + 35/768*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*x*arcsin(c*
x)/c + 1/256*(c^2*x^2 - 1)^4*b^2*d^3/c^2 + 35/768*(-c^2*x^2 + 1)^(3/2)*a*b*
d^3*x/c + 35/512*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c - 7/1152*(c^2*x
^2 - 1)^3*b^2*d^3/c^2 + 35/512*sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c + 35/3072*(c^
2*x^2 - 1)^2*b^2*d^3/c^2 + 35/1024*b^2*d^3*arcsin(c*x)^2/c^2 + 1/2*(c^2*x^2
 - 1)*a^2*d^3/c^2 - 35/1024*(c^2*x^2 - 1)*b^2*d^3/c^2 + 35/512*a*b*d^3*arcs
in(c*x)/c^2 - 7175/294912*b^2*d^3/c^2
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.178 $\int \left(d-c^2dx^2\right)^3 (a+b\textbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=298

$$-\frac{4322b^2d^3x}{3675}+\frac{1514b^2c^2d^3x^3}{11025}-\frac{234b^2c^4d^3x^5}{6125}+\frac{2}{343}b^2c^6d^3x^7+\frac{32bd^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{35c}+\frac{16bd^3(1-c^2 \ldots}{}$$

```
[Out] -4322/3675*b^2*d^3*x+1514/11025*b^2*c^2*d^3*x^3-234/6125*b^2*c^4*d^3*x^5+2/
343*b^2*c^6*d^3*x^7+16/105*b*d^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+12/
175*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c+2/49*b*d^3*(-c^2*x^2+1)^(7
/2)*(a+b*arcsin(c*x))/c+16/35*d^3*x*(a+b*arcsin(c*x))^2+8/35*d^3*x*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2+6/35*d^3*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+1/7*
d^3*x*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2+32/35*b*d^3*(a+b*arcsin(c*x))*(-c^
2*x^2+1)^(1/2)/c
```

Rubi [A]

time = 0.26, antiderivative size = 298, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4743, 4715, 4767, 8, 200}

$$\frac{1}{7}d^3x\left(1-c^2x^2\right)^3(a+b\text{ArcSin}(cx))^2+\frac{6}{35}d^3x\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2+\frac{8}{35}d^3x\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2+\frac{2bd^3(1-c^2x^2)^{7/2}(a+b\text{ArcSin}(cx))}{49c}+\frac{12bd^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{175c}+\frac{16bd^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{105c}+\frac{32bd^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{35c}+\frac{16}{35}d^3x(a+b\text{ArcSin}(cx))^2+\frac{2}{343}b^2c^6d^3x^7-\frac{234b^2c^4d^3x^5}{6125}+\frac{1514b^2c^2d^3x^3}{11025}-\frac{4322b^2d^3x}{3675}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-4322*b^2*d^3*x)/3675 + (1514*b^2*c^2*d^3*x^3)/11025 - (234*b^2*c^4*d^3*x^
5)/6125 + (2*b^2*c^6*d^3*x^7)/343 + (32*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcS
in[c*x]))/(35*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*
c) + (12*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d^3*
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c) + (16*d^3*x*(a + b*ArcSin[c
*x])^2)/35 + (8*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (6*d^3*x*(1
 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/35 + (d^3*x*(1 - c^2*x^2)^3*(a + b*Arc
Sin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{7}d^3x\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{7}(6d)\int \left(d-c^2dx^2\right)^2\left(a+b\right.$$

$$= \frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)}{49c}+\frac{6}{35}d^3x\left(1-c^2x^2\right)^2\left(a+b\sin^{-}\right.$$

$$= \frac{12bd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{175c}+\frac{2bd^3\left(1-c^2x^2\right)^{7/2}\left(a+b\sin^{\cdot}\right.}{49c}$$

$$= -\frac{2}{49}b^2d^3x+\frac{2}{49}b^2c^2d^3x^3-\frac{6}{245}b^2c^4d^3x^5+\frac{2}{343}b^2c^6d^3x^7+\frac{16bd^3(1}{}$$

$$= -\frac{962b^2d^3x}{3675}+\frac{1514b^2c^2d^3x^3}{11025}-\frac{234b^2c^4d^3x^5}{6125}+\frac{2}{343}b^2c^6d^3x^7+\frac{32bd^3}{}$$

$$= -\frac{4322b^2d^3x}{3675}+\frac{1514b^2c^2d^3x^3}{11025}-\frac{234b^2c^4d^3x^5}{6125}+\frac{2}{343}b^2c^6d^3x^7+\frac{32bd}{}$$

Mathematica [A]
time = 0.25, size = 241, normalized size = 0.81

$$-\frac{d^3\left(2b^2cx(226905-26495c^2x^2+7371c^4x^4-1125c^6x^6)+11025a^2cx(-35+35c^2x^2-21c^4x^4+5c^6x^6)+210ab\sqrt{1-c^2x^2}\,(-2161+757c^2x^2-351c^4x^4+75c^6x^6)+210b\left(105acx(-35+35c^2x^2-21c^4x^4+5c^6x^6)+b\sqrt{1-c^2x^2}\,(-2161+757c^2x^2-351c^4x^4+75c^6x^6)\right)\text{ArcSin}(cx)+11025b^2cx(-35+35c^2x^2-21c^4x^4+5c^6x^6)\,\text{ArcSin}(cx)^2\right)}{385875c}$$

Antiderivative was successfully verified.

[In] Integrate[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]

[Out] -1/385875*(d^3*(2*b^2*c*x*(226905 - 26495*c^2*x^2 + 7371*c^4*x^4 - 1125*c^6*x^6) + 11025*a^2*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + 210*a*b*Sqrt[1 - c^2*x^2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 210*b*(105*a*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6))*ArcSin[c*x] + 11025*b^2*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]^2))/c

Maple [A]
time = 0.08, size = 384, normalized size = 1.29

method	result
derivativedivides	$\frac{-d^3a^2\left(\frac{1}{7}c^7x^7-\frac{3}{5}c^5x^5+c^3x^3-cx\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+}}{49}\right.}{}$
default	$\frac{-d^3a^2\left(\frac{1}{7}c^7x^7-\frac{3}{5}c^5x^5+c^3x^3-cx\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+}}{49}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/c*(-d^3*a^2*(1/7*c^7*x^7-3/5*c^5*x^5+c^3*x^3-c*x)-d^3*b^2*(1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+2/49*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/1715*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x-12/175*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)+4/875*(3*c^4*x^4-10*c^2*x^2+15)*c*x+16/105*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-16/315*(c^2*x^2-3)*c*x+32/35*c*x-32/35*arcsin(c*x)*(-c^2*x^2+1)^(1/2))-2*d^3*a*b*(1/7*arcsin(c*x)*c^7*x^7-3/5*arcsin(c*x)*c^5*x^5+c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-117/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)+757/3675*c^2*x^2*(-c^2*x^2+1)^(1/2)-2161/3675*(-c^2*x^2+1)^(1/2)))

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 729 vs. $2(263) = 526$.
time = 0.50, size = 729, normalized size = 2.45

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] -1/7*b^2*c^6*d^3*x^7*arcsin(c*x)^2 - 1/7*a^2*c^6*d^3*x^7 + 3/5*b^2*c^4*d^3*x^5*arcsin(c*x)^2 + 3/5*a^2*c^4*d^3*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^6*d^3 - 2/25725*(105*(5*s

```
qrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2
+ 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126
*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^6*d^3 - b^2*c^2*d^3*x^3*arcsin(
c*x)^2 + 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^4*d^3 + 2/375*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^4*d^3 - a^2*c^2*d^3*x^3 - 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d^3 - 2/9*(3*c*(sqrt(-c^2*x^2 +
 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*
b^2*c^2*d^3 + b^2*d^3*x*arcsin(c*x)^2 - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*a
rcsin(c*x)/c) + a^2*d^3*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^
3/c
```

Fricas [A]
time = 7.14, size = 323, normalized size = 1.08

$$-\frac{1125\,(49\,a^2-2\,b^2)c^7d^3x^7-189\,(1225\,a^2-78\,b^2)c^5d^3x^5+35\,(11025\,a^2-1514\,b^2)c^3d^3x^3-105\,(3675\,a^2-4322\,b^2)cd^3x+11025\,(5\,b^2c^7d^3x^7-21\,b^2c^5d^3x^5+35\,b^2c^3d^3x^3-35\,b^2cd^3x)\arcsin(cx)^2+22050\,(5\,abc^7d^3x^7-21\,abc^5d^3x^5+35\,abc^3d^3x^3-35\,abcd^3x)\arcsin(cx)+210\,(75\,abc^6d^3x^6-351\,abc^4d^3x^4+757\,abc^2d^3x^2-2161\,abd^3+(75\,b^2c^6d^3x^6-351\,b^2c^4d^3x^4+757\,b^2c^2d^3x^2-2161\,b^2d^3)\arcsin(cx))\sqrt{-c^2x^2+1}}{385875\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/385875*(1125*(49*a^2 - 2*b^2)*c^7*d^3*x^7 - 189*(1225*a^2 - 78*b^2)*c^5*
d^3*x^5 + 35*(11025*a^2 - 1514*b^2)*c^3*d^3*x^3 - 105*(3675*a^2 - 4322*b^2)
*c*d^3*x + 11025*(5*b^2*c^7*d^3*x^7 - 21*b^2*c^5*d^3*x^5 + 35*b^2*c^3*d^3*x
^3 - 35*b^2*c*d^3*x)*arcsin(c*x)^2 + 22050*(5*a*b*c^7*d^3*x^7 - 21*a*b*c^5*
d^3*x^5 + 35*a*b*c^3*d^3*x^3 - 35*a*b*c*d^3*x)*arcsin(c*x) + 210*(75*a*b*c^
6*d^3*x^6 - 351*a*b*c^4*d^3*x^4 + 757*a*b*c^2*d^3*x^2 - 2161*a*b*d^3 + (75*
b^2*c^6*d^3*x^6 - 351*b^2*c^4*d^3*x^4 + 757*b^2*c^2*d^3*x^2 - 2161*b^2*d^3)
*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A]
time = 1.20, size = 524, normalized size = 1.76

$$\begin{cases} -\frac{a^2c^6d^3x^7}{7}+\frac{3a^2c^4d^3x^5}{5}-a^2c^2d^3x^3+a^2d^3x-\frac{2abc^6d^3x^7\operatorname{asin}(cx)}{7}-\frac{2abc^5d^3x^6\sqrt{-c^2x^2+1}}{49}+\frac{6abc^4d^3x^5\operatorname{asin}(cx)}{5}+\frac{234abc^3d^3x^4\sqrt{-c^2x^2+1}}{1225}-2abc^2d^3x^3\operatorname{asin}(cx)-\frac{1514abcd^3x^2\sqrt{-c^2x^2+1}}{3675}+2abd^3x\operatorname{asin}(cx)+\frac{4322abd^3\sqrt{-c^2x^2+1}}{3675c}-\frac{b^2c^6d^3x^7\operatorname{asin}^2(cx)}{7}+\frac{2b^2c^6d^3x^7}{343}-\frac{2b^2c^5d^3x^6\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{49}+\frac{3b^2c^4d^3x^5\operatorname{asin}^2(cx)}{5}-\frac{234b^2c^4d^3x^5}{6125}+\frac{234b^2c^3d^3x^4\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{1225}-b^2c^2d^3x^3\operatorname{asin}^2(cx)+\frac{1514b^2c^2d^3x^3}{11025}-\frac{1514b^2cd^3x^2\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{3675}+b^2d^3x\operatorname{asin}^2(cx)-\frac{4322b^2d^3x}{3675}+\frac{4322b^2d^3\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{3675c} & \text{for}\: c\neq 0 \\ a^2d^3x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**7/7 + 3*a**2*c**4*d**3*x**5/5 - a**2*c**2*d**
3*x**3 + a**2*d**3*x - 2*a*b*c**6*d**3*x**7*asin(c*x)/7 - 2*a*b*c**5*d**3*x
**6*sqrt(-c**2*x**2 + 1)/49 + 6*a*b*c**4*d**3*x**5*asin(c*x)/5 + 234*a*b*c*
*3*d**3*x**4*sqrt(-c**2*x**2 + 1)/1225 - 2*a*b*c**2*d**3*x**3*asin(c*x) - 1
514*a*b*c*d**3*x**2*sqrt(-c**2*x**2 + 1)/3675 + 2*a*b*d**3*x*asin(c*x) + 43
22*a*b*d**3*sqrt(-c**2*x**2 + 1)/(3675*c) - b**2*c**6*d**3*x**7*asin(c*x)**
2/7 + 2*b**2*c**6*d**3*x**7/343 - 2*b**2*c**5*d**3*x**6*sqrt(-c**2*x**2 + 1
```

```
)*asin(c*x)/49 + 3*b**2*c**4*d**3*x**5*asin(c*x)**2/5 - 234*b**2*c**4*d**3*
x**5/6125 + 234*b**2*c**3*d**3*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/1225 - b
**2*c**2*d**3*x**3*asin(c*x)**2 + 1514*b**2*c**2*d**3*x**3/11025 - 1514*b**
2*c*d**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/3675 + b**2*d**3*x*asin(c*x)**
2 - 4322*b**2*d**3*x/3675 + 4322*b**2*d**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
3675*c), Ne(c, 0)), (a**2*d**3*x, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 528 vs. 2(263) = 526.
time = 0.43, size = 528, normalized size = 1.77

$$-\frac{1}{7}a^2c^6d^3x^7+\frac{3}{5}a^2c^4d^3x^5-\frac{1}{7}\left(c^2x^2-1\right)^3b^2d^3x\arcsin\left(cx\right)^2-a^2c^2d^3x^3-\frac{2}{7}\left(c^2x^2-1\right)^3abd^3x\arcsin\left(cx\right)+\frac{6}{35}\left(c^2x^2-1\right)^2b^2d^3x\arcsin\left(cx\right)^2+\frac{2}{343}\left(c^2x^2-1\right)^3b^2d^3x+\frac{12}{35}\left(c^2x^2-1\right)^2abd^3x\arcsin\left(cx\right)-\frac{8}{35}\left(c^2x^2-1\right)b^2d^3x\arcsin\left(cx\right)^2-\frac{2\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}\,b^2d^3\arcsin\left(cx\right)}{49\,c}-\frac{888}{42875}\left(c^2x^2-1\right)^2b^2d^3x-\frac{16}{35}\left(c^2x^2-1\right)abd^3x\arcsin\left(cx\right)+\frac{16}{35}b^2d^3x\arcsin\left(cx\right)^2-\frac{2\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}\,abd^3}{49\,c}+\frac{12\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\,b^2d^3\arcsin\left(cx\right)}{175\,c}+\frac{30256}{385875}\left(c^2x^2-1\right)b^2d^3x+\frac{32}{35}abd^3x\arcsin\left(cx\right)+\frac{12\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}\,abd^3}{175\,c}+\frac{16\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2d^3\arcsin\left(cx\right)}{105\,c}+a^2d^3x-\frac{413312}{385875}b^2d^3x+\frac{16\left(-c^2x^2+1\right)^{\frac{3}{2}}abd^3}{105\,c}+\frac{32\sqrt{-c^2x^2+1}\,b^2d^3\arcsin\left(cx\right)}{35\,c}+\frac{32\sqrt{-c^2x^2+1}\,abd^3}{35\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/7*a^2*c^6*d^3*x^7 + 3/5*a^2*c^4*d^3*x^5 - 1/7*(c^2*x^2 - 1)^3*b^2*d^3*x*
arcsin(c*x)^2 - a^2*c^2*d^3*x^3 - 2/7*(c^2*x^2 - 1)^3*a*b*d^3*x*arcsin(c*x)
 + 6/35*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2 + 2/343*(c^2*x^2 - 1)^3*b^2
*d^3*x + 12/35*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x) - 8/35*(c^2*x^2 - 1)*b
^2*d^3*x*arcsin(c*x)^2 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*ar
csin(c*x)/c - 888/42875*(c^2*x^2 - 1)^2*b^2*d^3*x - 16/35*(c^2*x^2 - 1)*a*b
*d^3*x*arcsin(c*x) + 16/35*b^2*d^3*x*arcsin(c*x)^2 - 2/49*(c^2*x^2 - 1)^3*s
qrt(-c^2*x^2 + 1)*a*b*d^3/c + 12/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2
*d^3*arcsin(c*x)/c + 30256/385875*(c^2*x^2 - 1)*b^2*d^3*x + 32/35*a*b*d^3*x
*arcsin(c*x) + 12/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c + 16/105
*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*arcsin(c*x)/c + a^2*d^3*x - 413312/385875*b^2
*d^3*x + 16/105*(-c^2*x^2 + 1)^(3/2)*a*b*d^3/c + 32/35*sqrt(-c^2*x^2 + 1)*b
^2*d^3*arcsin(c*x)/c + 32/35*sqrt(-c^2*x^2 + 1)*a*b*d^3/c
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.179 $\int \frac{(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=354

$$\frac{71}{144}b^2c^2d^3x^2-\frac{7}{144}b^2c^4d^3x^4-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)$$

```
[Out] 71/144*b^2*c^2*d^3*x^2-7/144*b^2*c^4*d^3*x^4-1/108*b^2*d^3*(-c^2*x^2+1)^3-7
/36*b*c*d^3*x*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-1/18*b*c*d^3*x*(-c^2*x^2
+1)^(5/2)*(a+b*arcsin(c*x))-19/48*d^3*(a+b*arcsin(c*x))^2+1/2*d^3*(-c^2*x^2
+1)*(a+b*arcsin(c*x))^2+1/4*d^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+1/6*d^3*
(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2-1/3*I*d^3*(a+b*arcsin(c*x))^3/b+d^3*(a+b
*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*b*d^3*(a+b*arcsin(c*x)
)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b^2*d^3*polylog(3,(I*c*x+(-c^
2*x^2+1)^(1/2))^2)-19/24*b*c*d^3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.46, antiderivative size = 354, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 13, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.482$, Rules used = {4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 4743, 14, 267}

$$-\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))+\frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\text{ArcSin}(cx))^2+\frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2+\frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2-ibd^3\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{id^3(a+b\text{ArcSin}(cx))^3}{3b}-\frac{19}{48}d^3(a+b\text{ArcSin}(cx))^2+d^3\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2+\frac{1}{2}b^2d^3\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{7}{144}b^2c^4d^3x^4+\frac{71}{144}b^2c^2d^3x^2-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (71*b^2*c^2*d^3*x^2)/144 - (7*b^2*c^4*d^3*x^4)/144 - (b^2*d^3*(1 - c^2*x^2)
^3)/108 - (19*b*c*d^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/24 - (7*b*c*
d^3*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/36 - (b*c*d^3*x*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x]))/18 - (19*d^3*(a + b*ArcSin[c*x])^2)/48 + (d^3*
(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/6 - ((I/3)*d^3*(a
 + b*ArcSin[c*x])^3)/b + d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[
c*x])] - I*b*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] + (b
^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^3 (a+b\sin^{-1}(cx))^2}{x}\,dx = \frac{1}{6}d^3(1-c^2x^2)^3 (a+b\sin^{-1}(cx))^2 + d\int \frac{(d-c^2dx^2)^2 (a+b\sin^{-1}(cx$$

$$= -\frac{1}{18}bcd^3x(1-c^2x^2)^{5/2} (a+b\sin^{-1}(cx)) + \frac{1}{4}d^3(1-c^2x^2)^2 (a+b\sin$$

$$= -\frac{1}{108}b^2d^3(1-c^2x^2)^3 - \frac{7}{36}bcd^3x(1-c^2x^2)^{3/2} (a+b\sin^{-1}(cx)) - \frac{1}{18}$$

$$= -\frac{1}{108}b^2d^3(1-c^2x^2)^3 - \frac{19}{24}bcd^3x\sqrt{1-c^2x^2} (a+b\sin^{-1}(cx)) - \frac{7}{36}bc$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3(1-c^2x^2)^3 - \frac{19}{24}bcd^3x\sqrt{1-c$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3(1-c^2x^2)^3 - \frac{19}{24}bcd^3x\sqrt{1-c$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3(1-c^2x^2)^3 - \frac{19}{24}bcd^3x\sqrt{1-c$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3(1-c^2x^2)^3 - \frac{19}{24}bcd^3x\sqrt{1-c$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3(1-c^2x^2)^3 - \frac{19}{24}bcd^3x\sqrt{1-c$$

Mathematica [A]
time = 0.47, size = 466, normalized size = 1.32

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^3*((-144*I)*b^2*Pi^3 - 5184*a^2*c^2*x^2 + 2592*a^2*c^4*x^4 - 576*a^2*c^6
*x^6 - 3600*a*b*c*x*Sqrt[1 - c^2*x^2] + 1056*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]
- 192*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] - 10368*a*b*c^2*x^2*ArcSin[c*x] + 5184*
a*b*c^4*x^4*ArcSin[c*x] - 1152*a*b*c^6*x^6*ArcSin[c*x] - (3456*I)*a*b*ArcSi
n[c*x]^2 + (1152*I)*b^2*ArcSin[c*x]^3 + 7200*a*b*ArcTan[(c*x)/(-1 + Sqrt[1
- c^2*x^2])] - 783*b^2*Cos[2*ArcSin[c*x]] + 1566*b^2*ArcSin[c*x]^2*Cos[2*Ar
cSin[c*x]] - 27*b^2*Cos[4*ArcSin[c*x]] + 216*b^2*ArcSin[c*x]^2*Cos[4*ArcSin
[c*x]] - b^2*Cos[6*ArcSin[c*x]] + 18*b^2*ArcSin[c*x]^2*Cos[6*ArcSin[c*x]] +
 3456*b^2*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 6912*a*b*ArcSin[c
*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 3456*a^2*Log[c*x] + (3456*I)*b^2*ArcSi
n[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (3456*I)*a*b*PolyLog[2, E^((2*I
)*ArcSin[c*x])] + 1728*b^2*PolyLog[3, E^((-2*I)*ArcSin[c*x])] - 1566*b^2*Ar
```

```
cSin[c*x]*Sin[2*ArcSin[c*x]] - 108*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]] - 6*b
^2*ArcSin[c*x]*Sin[6*ArcSin[c*x]]))/3456
```

Maple [A]
time = 0.46, size = 661, normalized size = 1.87

method	result
derivativedivides	$-\frac{29d^3ab\sin(2\arcsin(cx))}{64}-\frac{d^3b^2\cos(6\arcsin(cx))}{3456}-\frac{d^3b^2\cos(4\arcsin(cx))}{128}-\frac{29d^3b^2\cos(2\arcsin(cx))}{128}+d^3a^2$
default	$-\frac{29d^3ab\sin(2\arcsin(cx))}{64}-\frac{d^3b^2\cos(6\arcsin(cx))}{3456}-\frac{d^3b^2\cos(4\arcsin(cx))}{128}-\frac{29d^3b^2\cos(2\arcsin(cx))}{128}+d^3a^2$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -29/64*d^3*a*b*sin(2*arcsin(c*x))+2*d^3*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1
/2))+2*d^3*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-1/3456*d^3*b^2*cos(6*ar
csin(c*x))-1/128*d^3*b^2*cos(4*arcsin(c*x))-29/128*d^3*b^2*cos(2*arcsin(c*x
))+d^3*a^2*ln(c*x)+2*d^3*a*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*d
^3*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/96*d^3*a*b*arcsin(c*x)*
cos(6*arcsin(c*x))+1/8*d^3*a*b*arcsin(c*x)*cos(4*arcsin(c*x))+29/32*d^3*a*b
*arcsin(c*x)*cos(2*arcsin(c*x))-I*d^3*a*b*arcsin(c*x)^2-2*I*d^3*a*b*polylog
(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*I*d^3*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2
))-2*I*d^3*b^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*I*d^3*b^2*
arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+d^3*b^2*arcsin(c*x)^2*ln(1
-I*c*x-(-c^2*x^2+1)^(1/2))+d^3*b^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))+1/192*d^3*b^2*arcsin(c*x)^2*cos(6*arcsin(c*x))-1/576*d^3*b^2*arcsin(c*
x)*sin(6*arcsin(c*x))+1/16*d^3*b^2*arcsin(c*x)^2*cos(4*arcsin(c*x))-1/32*d^
3*b^2*arcsin(c*x)*sin(4*arcsin(c*x))+29/64*d^3*b^2*arcsin(c*x)^2*cos(2*arcs
in(c*x))-29/64*d^3*b^2*arcsin(c*x)*sin(2*arcsin(c*x))-1/3*I*d^3*b^2*arcsin(
c*x)^3-3/2*d^3*a^2*c^2*x^2-1/6*d^3*a^2*c^6*x^6+3/4*d^3*a^2*c^4*x^4-1/576*d^
3*a*b*sin(6*arcsin(c*x))-1/32*d^3*a*b*sin(4*arcsin(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/6*a^2*c^6*d^3*x^6 + 3/4*a^2*c^4*d^3*x^4 - 3/2*a^2*c^2*d^3*x^2 + a^2*d^3*
log(x) - integrate(((b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^
2 - b^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^6*d^3*
x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a*b*d^3)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d^3\left(\int\left(-\frac{a^2}{x}\right)dx+\int 3a^2c^2x\,dx+\int\left(-3a^2c^4x^3\right)dx+\int a^2c^6x^5\,dx+\int\left(-\frac{b^2\operatorname{asin}^2(cx)}{x}\right)dx+\int\left(-\frac{2ab\operatorname{asin}(cx)}{x}\right)dx+\int 3b^2c^2x\operatorname{asin}^2(cx)\,dx+\int\left(-3b^2c^4x^3\operatorname{asin}^2(cx)\right)dx+\int b^2c^6x^5\operatorname{asin}^2(cx)\,dx+\int 6abc^2x\operatorname{asin}(cx)\,dx+\int\left(-6abc^4x^3\operatorname{asin}(cx)\right)dx+\int 2abc^6x^5\operatorname{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x,x)
```

```
[Out] -d**3*(Integral(-a**2/x, x) + Integral(3*a**2*c**2*x, x) + Integral(-3*a**2
*c**4*x**3, x) + Integral(a**2*c**6*x**5, x) + Integral(-b**2*asin(c*x)**2/
x, x) + Integral(-2*a*b*asin(c*x)/x, x) + Integral(3*b**2*c**2*x*asin(c*x)*
*2, x) + Integral(-3*b**2*c**4*x**3*asin(c*x)**2, x) + Integral(b**2*c**6*x
**5*asin(c*x)**2, x) + Integral(6*a*b*c**2*x*asin(c*x), x) + Integral(-6*a*
b*c**4*x**3*asin(c*x), x) + Integral(2*a*b*c**6*x**5*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^3}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x, x)
```

3.180 $\int \frac{(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=329

$$\frac{122}{25}b^2c^2d^3x-\frac{14}{75}b^2c^4d^3x^3+\frac{2}{125}b^2c^6d^3x^5-\frac{22}{5}bcd^3\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))-\frac{2}{5}bcd^3\left(1-c^2x^2\right)^{3/2}(a+b\mathrm{ArcS}$$

```
[Out] 122/25*b^2*c^2*d^3*x-14/75*b^2*c^4*d^3*x^3+2/125*b^2*c^6*d^3*x^5-2/5*b*c*d^
3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-2/25*b*c*d^3*(-c^2*x^2+1)^(5/2)*(a+b
*arcsin(c*x))-16/5*c^2*d^3*x*(a+b*arcsin(c*x))^2-8/5*c^2*d^3*x*(-c^2*x^2+1)
*(a+b*arcsin(c*x))^2-6/5*c^2*d^3*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2-d^3*(
-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2/x-4*b*c*d^3*(a+b*arcsin(c*x))*arctanh(I*c
*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*c*d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2
*I*b^2*c*d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-22/5*b*c*d^3*(a+b*arcsin(c
*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.48, antiderivative size = 329, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$, Rules used = {4785, 4743, 4715, 4767, 8, 200, 4787, 4783, 4803, 4268, 2317, 2438}

$$-\frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2(a+b\mathrm{ArcSin}(cx))^2-\frac{8}{5}c^2d^3x\left(1-c^2x^2\right)(a+b\mathrm{ArcSin}(cx))^2-\frac{2}{25}bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\mathrm{ArcSin}(cx))-\frac{2}{5}bcd^3\left(1-c^2x^2\right)^{3/2}(a+b\mathrm{ArcSin}(cx))-\frac{22}{5}bcd^3\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))-\frac{d^3(1-c^2x^2)^3(a+b\mathrm{ArcSin}(cx))^2}{x}-\frac{16}{5}c^2d^3x(a+b\mathrm{ArcSin}(cx))^2-4bcd^3\tanh^{-1}\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))+2ib^2cd^3\mathrm{Li}_2\left(-e^{i\mathrm{ArcSin}(cx)}\right)-2ib^2cd^3\mathrm{Li}_2\left(e^{i\mathrm{ArcSin}(cx)}\right)+\frac{2}{125}b^2c^6d^3x^5-\frac{14}{75}b^2c^4d^3x^3+\frac{122}{25}b^2c^2d^3x$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (122*b^2*c^2*d^3*x)/25 - (14*b^2*c^4*d^3*x^3)/75 + (2*b^2*c^6*d^3*x^5)/125
- (22*b*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x]))/25 - (16*c^2*d^3*x*(a + b*ArcSin[c*x])^2)/5 - (8*c^2*d^3*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/5 - (6*c^2*d^3*x*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/5 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/x - 4*b*c*
d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^3*PolyLo
g[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^3*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
```

```
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx=-\frac{d^3\left(1-c^2x^2\right)^3\left(a+b\sin^{-1}(cx)\right)^2}{x}-\left(6c^2d\right)\int\left(d-c^2dx^2\right)^2\left(a+b\sin\right.$$

$$=\frac{2}{5}bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)-\frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2\left(a+b\sin^{-}\right.$$

$$=\frac{2}{3}bcd^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)-\frac{2}{25}bcd^3\left(1-c^2x^2\right)^{5/2}\left(a+b\sin\right.$$

$$=-\frac{16}{15}b^2c^2d^3x+\frac{22}{45}b^2c^4d^3x^3-\frac{2}{25}b^2c^6d^3x^5+2bcd^3\sqrt{1-c^2x^2}\left(a+b\sin\right.$$

$$=-\frac{38}{25}b^2c^2d^3x-\frac{14}{75}b^2c^4d^3x^3+\frac{2}{125}b^2c^6d^3x^5-\frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\right.$$

$$=\frac{122}{25}b^2c^2d^3x-\frac{14}{75}b^2c^4d^3x^3+\frac{2}{125}b^2c^6d^3x^5-\frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\right.$$

$$=\frac{122}{25}b^2c^2d^3x-\frac{14}{75}b^2c^4d^3x^3+\frac{2}{125}b^2c^6d^3x^5-\frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\right.$$

$$=\frac{122}{25}b^2c^2d^3x-\frac{14}{75}b^2c^4d^3x^3+\frac{2}{125}b^2c^6d^3x^5-\frac{22}{5}bcd^3\sqrt{1-c^2x^2}\left(a+b\right.$$

Mathematica [A]
time = 0.83, size = 483, normalized size = 1.47

$$\frac{1}{720}d^3\left(-\frac{720a^2}{x}-2160a^2c^2x+3460b^2c^2x+720a^2c^4x^3-144a^2c^6x^5-\frac{17568}{5}abc\sqrt{1-c^2x^2}+\frac{2016}{5}abc^3x^2\sqrt{1-c^2x^2}-\frac{288}{5}abc^5x^4\sqrt{1-c^2x^2}-\frac{1440ab\text{ArcSin}(cx)}{x}-4320abc^2x\text{ArcSin}(cx)+1440abc^4x^3\text{ArcSin}(cx)-288abc^6x^5\text{ArcSin}(cx)-3420b^2c\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)-\frac{720b^2\text{ArcSin}(cx)^2}{x}-1890b^2c^2x\text{ArcSin}(cx)^2-1440abc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+80b^2c^2x\cos(2\text{ArcSin}(cx))-360b^2c^2x\text{ArcSin}(cx)^2\cos(2\text{ArcSin}(cx))-90b^2c\text{ArcSin}(cx)\cos(3\text{ArcSin}(cx))-\frac{18}{5}b^2c\text{ArcSin}(cx)\cos(5\text{ArcSin}(cx))+1440b^2c\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)-1440b^2c\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)+1440ib^2c\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-1440ib^2c\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)-10b^2c\sin(3\text{ArcSin}(cx))+45b^2c\text{ArcSin}(cx)^2\sin(3\text{ArcSin}(cx))+\frac{18}{25}b^2c\sin(5\text{ArcSin}(cx))-9b^2c\text{ArcSin}(cx)^2\sin(5\text{ArcSin}(cx))\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^3*((-720*a^2)/x - 2160*a^2*c^2*x + 3460*b^2*c^2*x + 720*a^2*c^4*x^3 - 14
4*a^2*c^6*x^5 - (17568*a*b*c*Sqrt[1 - c^2*x^2])/5 + (2016*a*b*c^3*x^2*Sqrt[
1 - c^2*x^2])/5 - (288*a*b*c^5*x^4*Sqrt[1 - c^2*x^2])/5 - (1440*a*b*ArcSin[
c*x])/x - 4320*a*b*c^2*x*ArcSin[c*x] + 1440*a*b*c^4*x^3*ArcSin[c*x] - 288*a
*b*c^6*x^5*ArcSin[c*x] - 3420*b^2*c*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - (720*b^
2*ArcSin[c*x]^2)/x - 1890*b^2*c^2*x*ArcSin[c*x]^2 - 1440*a*b*c*ArcTanh[Sqrt
[1 - c^2*x^2]] + 80*b^2*c^2*x*Cos[2*ArcSin[c*x]] - 360*b^2*c^2*x*ArcSin[c*x
]^2*Cos[2*ArcSin[c*x]] - 90*b^2*c*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - (18*b^2*
c*ArcSin[c*x]*Cos[5*ArcSin[c*x]])/5 + 1440*b^2*c*ArcSin[c*x]*Log[1 - E^(I*A
rcSin[c*x])] - 1440*b^2*c*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (1440*I)
*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])] - (1440*I)*b^2*c*PolyLog[2, E^(I*ArcS
in[c*x])] - 10*b^2*c*Sin[3*ArcSin[c*x]] + 45*b^2*c*ArcSin[c*x]^2*Sin[3*ArcS
in[c*x]] + (18*b^2*c*Sin[5*ArcSin[c*x]])/25 - 9*b^2*c*ArcSin[c*x]^2*Sin[5*A
rcSin[c*x]]))/720
```

Maple [A]
time = 0.47, size = 464, normalized size = 1.41

method	result
derivativedivides	$c\left(-d^3a^2\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-\frac{19d^3b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{4}-\frac{19d^3b^2\arcsin(cx)^2cx}{8}+\right.$
default	$c\left(-d^3a^2\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-\frac{19d^3b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{4}-\frac{19d^3b^2\arcsin(cx)^2cx}{8}+\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-d^3*a^2*(1/5*c^5*x^5-c^3*x^3+3*c*x+1/c/x)-19/4*d^3*b^2*arcsin(c*x)*(-c^
2*x^2+1)^(1/2)-19/8*d^3*b^2*arcsin(c*x)^2*c*x+19/4*d^3*b^2*c*x-d^3*b^2/c/x*
arcsin(c*x)^2+2*d^3*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*d^3*b^
2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*d^3*b^2*polylog(2,I*c*x+(-
c^2*x^2+1)^(1/2))+2*I*d^3*b^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-1/200*d^
3*b^2*arcsin(c*x)*cos(5*arcsin(c*x))-1/80*d^3*b^2*arcsin(c*x)^2*sin(5*arcsi
n(c*x))+1/1000*d^3*b^2*sin(5*arcsin(c*x))-1/8*d^3*b^2*arcsin(c*x)*cos(3*arc
sin(c*x))-3/16*d^3*b^2*arcsin(c*x)^2*sin(3*arcsin(c*x))+1/24*d^3*b^2*sin(3*
arcsin(c*x))-2*d^3*a*b*(1/5*arcsin(c*x)*c^5*x^5-c^3*x^3*arcsin(c*x)+3*c*x*a
rcsin(c*x)+1/c/x*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-7/25*c^2*x^2*(
-c^2*x^2+1)^(1/2)+61/25*(-c^2*x^2+1)^(1/2)+arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] -1/5*a^2*c^6*d^3*x^5 - 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4
/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^6*
d^3 + a^2*c^4*d^3*x^3 + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/
c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^4*d^3 - 3*b^2*c^2*d^3*x*arcsin(c*x)^
2 + 6*b^2*c^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) - 3*a^2*c^2*d^3*x
- 6*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d^3 - 2*(c*log(2*sqrt(-c^2
*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d^3 - a^2*d^3/x - 1/5*((b
^2*c^6*d^3*x^6 - 5*b^2*c^4*d^3*x^4 + 5*b^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 + 5*x*integrate(2/5*(b^2*c^7*d^3*x^6 - 5*b^2*c^5*d^3*x^4
+ 5*b^2*c*d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))/(c^2*x^3 - x), x))/x
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d^3\left(\int 3a^2c^2\,dx + \int \left(-\frac{a^2}{x^2}\right)dx + \int \left(-3a^2c^4x^2\right)dx + \int a^2c^6x^4\,dx + \int 3b^2c^2\operatorname{asin}^2(cx)\,dx + \int \left(-\frac{b^2\operatorname{asin}^2(cx)}{x^2}\right)dx + \int 6abc^2\operatorname{asin}(cx)\,dx + \int \left(-\frac{2ab\operatorname{asin}(cx)}{x^2}\right)dx + \int \left(-3b^2c^4x^2\operatorname{asin}^2(cx)\right)dx + \int b^2c^6x^4\operatorname{asin}^2(cx)\,dx + \int \left(-6abc^4x^2\operatorname{asin}(cx)\right)dx + \int 2abc^6x^4\operatorname{asin}(cx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] -d**3*(Integral(3*a**2*c**2, x) + Integral(-a**2/x**2, x) + Integral(-3*a**
2*c**4*x**2, x) + Integral(a**2*c**6*x**4, x) + Integral(3*b**2*c**2*asin(c
*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**2, x) + Integral(6*a*b*c**2*asi
n(c*x), x) + Integral(-2*a*b*asin(c*x)/x**2, x) + Integral(-3*b**2*c**4*x**
2*asin(c*x)**2, x) + Integral(b**2*c**6*x**4*asin(c*x)**2, x) + Integral(-6
*a*b*c**4*x**2*asin(c*x), x) + Integral(2*a*b*c**6*x**4*asin(c*x), x))
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^2, x)
```

3.181 $\int \frac{(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=371

$$-\frac{21}{32}b^2c^4d^3x^2+\frac{1}{32}b^2c^6d^3x^4+\frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))-$$

```
[Out] -21/32*b^2*c^4*d^3*x^2+1/32*b^2*c^6*d^3*x^4-7/8*b*c^3*d^3*x*(-c^2*x^2+1)^(3
/2)*(a+b*arcsin(c*x))-b*c*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/x+3/32*c
^2*d^3*(a+b*arcsin(c*x))^2-3/2*c^2*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2-3/4
*c^2*d^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2-1/2*d^3*(-c^2*x^2+1)^3*(a+b*arc
sin(c*x))^2/x^2+I*c^2*d^3*(a+b*arcsin(c*x))^3/b-3*c^2*d^3*(a+b*arcsin(c*x))
^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+b^2*c^2*d^3*ln(x)+3*I*b*c^2*d^3*(a+b*
arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-3/2*b^2*c^2*d^3*polylo
g(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+3/16*b*c^3*d^3*x*(a+b*arcsin(c*x))*(-c^2*
x^2+1)^(1/2)
```

Rubi [A]
time = 0.49, antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4785, 4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 4743, 14, 272, 45}

$$3ibc^2d^3\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))-\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))^2-\frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))^2-\frac{bcd^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{x}-\frac{d^3(1-c^2x^2)^3(a+b\text{ArcSin}(cx))^2}{2x^2}+\frac{ic^2d^3(a+b\text{ArcSin}(cx))^3}{b}+\frac{3}{32}c^2d^3(a+b\text{ArcSin}(cx))^2-3c^2d^3\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2-\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))+\frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{3}{2}b^2c^2d^3\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)+\frac{1}{32}b^2c^6d^3x^4-\frac{21}{32}b^2c^4d^3x^2+b^2c^2d^3\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (-21*b^2*c^4*d^3*x^2)/32 + (b^2*c^6*d^3*x^4)/32 + (3*b*c^3*d^3*x*Sqrt[1 - c
^2*x^2]*(a + b*ArcSin[c*x]))/16 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x]))/8 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x + (3
*c^2*d^3*(a + b*ArcSin[c*x])^2)/32 - (3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/2 - (3*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - (d^3*(1
 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(2*x^2) + (I*c^2*d^3*(a + b*ArcSin[c*x
])^3)/b - 3*c^2*d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*x])] +
b^2*c^2*d^3*Log[x] + (3*I)*b*c^2*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I
)*ArcSin[c*x])] - (3*b^2*c^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
```

```
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^3\,(a+b\sin^{-1}(cx))^2}{x^3}\,dx = -\frac{d^3(1-c^2x^2)^3\,(a+b\sin^{-1}(cx))^2}{2x^2} - (3c^2d)\int \frac{(d-c^2dx^2)^2\,(a+b\sin}{x}$$

$$= -\frac{bcd^3(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))}{x} - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}\right.$$

$$= -\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{bcd^3(1-c^2x^2)^{5/2}\,(a+b\,\mathrm{s}}{x}$$

$$= \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right) - \frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\right.$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)$$

Mathematica [A]
time = 0.41, size = 556, normalized size = 1.50

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -1/256*(d^3*(128*a^2 - (32*I)*b^2*c^2*Pi^3*x^2 - 384*a^2*c^4*x^4 + 64*a^2*c
^6*x^6 + 256*a*b*c*x*Sqrt[1 - c^2*x^2] - 336*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]
+ 32*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] + 256*a*b*ArcSin[c*x] - 768*a*b*c^4*x^4*
ArcSin[c*x] + 128*a*b*c^6*x^6*ArcSin[c*x] + 256*b^2*c*x*Sqrt[1 - c^2*x^2]*A
rcSin[c*x] + 128*b^2*ArcSin[c*x]^2 - (768*I)*a*b*c^2*x^2*ArcSin[c*x]^2 + (2
56*I)*b^2*c^2*x^2*ArcSin[c*x]^3 + 672*a*b*c^2*x^2*ArcTan[(c*x)/(-1 + Sqrt[1
 - c^2*x^2])] - 80*b^2*c^2*x^2*Cos[2*ArcSin[c*x]] + 160*b^2*c^2*x^2*ArcSin[
c*x]^2*Cos[2*ArcSin[c*x]] - b^2*c^2*x^2*Cos[4*ArcSin[c*x]] + 8*b^2*c^2*x^2*
ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 768*b^2*c^2*x^2*ArcSin[c*x]^2*Log[1 - E^
((-2*I)*ArcSin[c*x])] + 1536*a*b*c^2*x^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSi
n[c*x])] + 768*a^2*c^2*x^2*Log[x] - 256*b^2*c^2*x^2*Log[c*x] + (768*I)*b^2*
c^2*x^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (768*I)*a*b*c^2*x^
2*PolyLog[2, E^((2*I)*ArcSin[c*x])] + 384*b^2*c^2*x^2*PolyLog[3, E^((-2*I)*
ArcSin[c*x])] - 160*b^2*c^2*x^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - 4*b^2*c^2*
x^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]]))/x^2
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 818 vs. 2(375) = 750.
time = 0.73, size = 819, normalized size = 2.21

method	result
derivativedivides	$c^2\left(-\frac{d^3b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{cx}+d^3b^2\ln\left(icx+\sqrt{-c^2x^2+1}-1\right)-2d^3b^2\ln\left(icx+\sqrt{\right.\right.$
default	$c^2\left(-\frac{d^3b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{cx}+d^3b^2\ln\left(icx+\sqrt{-c^2x^2+1}-1\right)-2d^3b^2\ln\left(icx+\sqrt{\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-d^3*b^2*arcsin(c*x)/c/x*(-c^2*x^2+1)^(1/2)-6*d^3*b^2*polylog(3,I*c*x+
(-c^2*x^2+1)^(1/2))-6*d^3*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+1/256*d^
3*b^2*cos(4*arcsin(c*x))-3*d^3*a^2*ln(c*x)-6*d^3*a*b*arcsin(c*x)*ln(1-I*c*x
-(-c^2*x^2+1)^(1/2))-6*d^3*a*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1
/16*d^3*a*b*arcsin(c*x)*cos(4*arcsin(c*x))+5/16*d^3*b^2+6*I*d^3*b^2*arcsin(
c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+6*I*d^3*b^2*arcsin(c*x)*polylog(2,
-I*c*x-(-c^2*x^2+1)^(1/2))+3*I*d^3*a*b*arcsin(c*x)^2+6*I*d^3*a*b*polylog(2,
I*c*x+(-c^2*x^2+1)^(1/2))+6*I*d^3*a*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-
1/2*d^3*b^2*arcsin(c*x)^2/c^2/x^2+5/4*d^3*b^2*arcsin(c*x)^2*c^2*x^2-5/8*b^2
*c^2*d^3*x^2-d^3*a*b*arcsin(c*x)/c^2/x^2+5/4*d^3*b^2*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)*c*x+5/4*d^3*a*b*(-c^2*x^2+1)^(1/2)*c*x+5/2*d^3*a*b*arcsin(c*x)*c^2
*x^2-d^3*a*b/c/x*(-c^2*x^2+1)^(1/2)-3*d^3*b^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^
2*x^2+1)^(1/2))-3*d^3*b^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/32
*d^3*b^2*arcsin(c*x)^2*cos(4*arcsin(c*x))+1/64*d^3*b^2*arcsin(c*x)*sin(4*ar
csin(c*x))+3/2*d^3*a^2*c^2*x^2-1/4*d^3*a^2*c^4*x^4+1/64*d^3*a*b*sin(4*arcsi
```

```
n(c*x))+d^3*b^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-2*d^3*b^2*ln(I*c*x+(-c^2*x^2
+1)^(1/2))-5/8*d^3*b^2*arcsin(c*x)^2+d^3*b^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
-1/2*d^3*a^2/c^2/x^2+I*d^3*b^2*arcsin(c*x)^3+I*d^3*b^2*arcsin(c*x)-5/4*d^3*
a*b*arcsin(c*x)+I*d^3*a*b)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*c^6*d^3*x^4 + 3/2*a^2*c^4*d^3*x^2 - 3*a^2*c^2*d^3*log(x) - a*b*d^3
*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a^2*d^3/x^2 - integrate((
(b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*
x^4 + 3*a*b*c^2*d^3*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/x^3, x
)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d^{3}\left(\int \left(-\frac{a^{2}}{x^{3}}\right)\, dx + \int \frac{3a^{2}c^{2}}{x}\, dx + \int \left(-3a^{2}c^{4}x\right)\, dx + \int a^{2}c^{6}x^{3}\, dx + \int \left(-\frac{b^{2}\operatorname{asin}^{2}{\left(cx \right)}}{x^{3}}\right)\, dx + \int \left(-\frac{2ab\operatorname{asin}{\left(cx \right)}}{x^{3}}\right)\, dx + \int \frac{3b^{2}c^{2}\operatorname{asin}^{2}{\left(cx \right)}}{x}\, dx + \int \left(-3b^{2}c^{4}x\operatorname{asin}^{2}{\left(cx \right)}\right)\, dx + \int b^{2}c^{6}x^{3}\operatorname{asin}^{2}{\left(cx \right)}\, dx + \int \frac{6abc^{2}\operatorname{asin}{\left(cx \right)}}{x}\, dx + \int \left(-6abc^{4}x\operatorname{asin}{\left(cx \right)}\right)\, dx + \int 2abc^{6}x^{3}\operatorname{asin}{\left(cx \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] -d**3*(Integral(-a**2/x**3, x) + Integral(3*a**2*c**2/x, x) + Integral(-3*a
**2*c**4*x, x) + Integral(a**2*c**6*x**3, x) + Integral(-b**2*asin(c*x)**2/
x**3, x) + Integral(-2*a*b*asin(c*x)/x**3, x) + Integral(3*b**2*c**2*asin(c
*x)**2/x, x) + Integral(-3*b**2*c**4*x*asin(c*x)**2, x) + Integral(b**2*c**
```

```
6*x**3*asin(c*x)**2, x) + Integral(6*a*b*c**2*asin(c*x)/x, x) + Integral(-6
*a*b*c**4*x*asin(c*x), x) + Integral(2*a*b*c**6*x**3*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^3,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^3, x)
```

3.182 $\int \frac{(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=348

$$-\frac{b^2c^2d^3}{3x}-\frac{50}{9}b^2c^4d^3x+\frac{2}{27}b^2c^6d^3x^3+5bc^3d^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))-\frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx)$$

```
[Out] -1/3*b^2*c^2*d^3/x-50/9*b^2*c^4*d^3*x+2/27*b^2*c^6*d^3*x^3-1/9*b*c^3*d^3*(-
c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-1/3*b*c*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcs
in(c*x))/x^2+16/3*c^4*d^3*x*(a+b*arcsin(c*x))^2+8/3*c^4*d^3*x*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2+2*c^2*d^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x-1/3*d^3*
(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2/x^3+34/3*b*c^3*d^3*(a+b*arcsin(c*x))*arc
tanh(I*c*x+(-c^2*x^2+1)^(1/2))-17/3*I*b^2*c^3*d^3*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+17/3*I*b^2*c^3*d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+5*b*c^3*
d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.66, antiderivative size = 348, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$, Rules used = {4785, 4743, 4715, 4767, 8, 4787, 4783, 4803, 4268, 2317, 2438, 276}

$$\frac{16}{3}c^4d^3x(a+b\text{ArcSin}(cx))^2+\frac{34}{3}bc^3d^3\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))+\frac{2c^2d^3(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2}{x}-\frac{bcd^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))}{3x^2}-\frac{d^3(1-c^2x^2)^3(a+b\text{ArcSin}(cx))^2}{3x^3}+\frac{8}{3}c^4d^3x(1-c^2x^2)(a+b\text{ArcSin}(cx))^2-\frac{1}{9}bc^3d^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))+5bc^3d^3\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))-\frac{17}{3}ib^2c^3d^3\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)+\frac{17}{3}ib^2c^3d^3\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)+\frac{2}{27}b^2c^6d^3x^3-\frac{50}{9}b^2c^4d^3x-\frac{b^2c^2d^3}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d^3)/x - (50*b^2*c^4*d^3*x)/9 + (2*b^2*c^6*d^3*x^3)/27 + 5*b*
c^3*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (b*c^3*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x]))/9 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(3*x^2) + (16*c^4*d^3*x*(a + b*ArcSin[c*x])^2)/3 + (8*c^4*d^3*x*(1 - c^
2*x^2)*(a + b*ArcSin[c*x])^2)/3 + (2*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[
c*x])^2)/x - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(3*x^3) + (34*b*c^
3*d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((17*I)/3)*b^2*c^
3*d^3*PolyLog[2, -E^(I*ArcSin[c*x])] + ((17*I)/3)*b^2*c^3*d^3*PolyLog[2, E^
(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
```

```
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^3 (a+b\sin^{-1}(cx))^2}{x^4} dx = -\frac{d^3(1-c^2x^2)^3 (a+b\sin^{-1}(cx))^2}{3x^3} - (2c^2d) \int \frac{(d-c^2dx^2)^2 (a+b\,\mathrm{si}}{x^2}$$

$$= -\frac{bcd^3(1-c^2x^2)^{5/2} (a+b\sin^{-1}(cx))}{3x^2} + \frac{2c^2d^3(1-c^2x^2)^2 (a+b\sin^-}{x}$$

$$= -\frac{17}{9}bc^3d^3(1-c^2x^2)^{3/2} (a+b\sin^{-1}(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2} (a+b}{3x^2}$$

$$= -\frac{b^2c^2d^3}{3x} + \frac{11}{9}b^2c^4d^3x - \frac{14}{27}b^2c^6d^3x^3 - \frac{17}{3}bc^3d^3\sqrt{1-c^2x^2} (a+b\,\mathrm{sin}$$

$$= -\frac{b^2c^2d^3}{3x} + \frac{46}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2} (a+b\sin^-$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2} (a+b\sin^-$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2} (a+b\sin^-$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2} (a+b\sin^-$$

Mathematica [A]
time = 0.72, size = 480, normalized size = 1.38

$$-\frac{d^3\left(9a^2-81a^2c^2x^2+9b^2c^2x^2-81a^2c^4x^4+150b^2c^4x^4+9a^2c^6x^6-2b^2c^6x^6+9abcx\sqrt{1-c^2x^2}-150abc^3x^3\sqrt{1-c^2x^2}+6abc^5x^5\sqrt{1-c^2x^2}+18ab\mathrm{ArcSin}(cx)-162abc^2x^2\mathrm{ArcSin}(cx)-162abc^4x^4\mathrm{ArcSin}(cx)+18abc^6x^6\mathrm{ArcSin}(cx)+9b^2cx\sqrt{1-c^2x^2}\mathrm{ArcSin}(cx)-150b^2c^3x^3\sqrt{1-c^2x^2}\mathrm{ArcSin}(cx)+6b^2c^5x^5\sqrt{1-c^2x^2}\mathrm{ArcSin}(cx)+9b^2\mathrm{ArcSin}(cx)^2-81b^2c^2x^2\mathrm{ArcSin}(cx)^2-81b^2c^4x^4\mathrm{ArcSin}(cx)^2+9b^2c^6x^6\mathrm{ArcSin}(cx)^2-153abc^3x^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+153b^2c^3x^3\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)-153b^2c^3x^3\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)+153ib^2c^3x^3\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)-153ib^2c^3x^3\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{27x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/27*(d^3*(9*a^2 - 81*a^2*c^2*x^2 + 9*b^2*c^2*x^2 - 81*a^2*c^4*x^4 + 150*b
^2*c^4*x^4 + 9*a^2*c^6*x^6 - 2*b^2*c^6*x^6 + 9*a*b*c*x*Sqrt[1 - c^2*x^2] -
150*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 6*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] + 18*a*
b*ArcSin[c*x] - 162*a*b*c^2*x^2*ArcSin[c*x] - 162*a*b*c^4*x^4*ArcSin[c*x] +
 18*a*b*c^6*x^6*ArcSin[c*x] + 9*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 150
*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 6*b^2*c^5*x^5*Sqrt[1 - c^2*x^2
]*ArcSin[c*x] + 9*b^2*ArcSin[c*x]^2 - 81*b^2*c^2*x^2*ArcSin[c*x]^2 - 81*b^2
*c^4*x^4*ArcSin[c*x]^2 + 9*b^2*c^6*x^6*ArcSin[c*x]^2 - 153*a*b*c^3*x^3*ArcT
anh[Sqrt[1 - c^2*x^2]] + 153*b^2*c^3*x^3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*
x])] - 153*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (153*I)*b^2
*c^3*x^3*PolyLog[2, -E^(I*ArcSin[c*x])] - (153*I)*b^2*c^3*x^3*PolyLog[2, E^
(I*ArcSin[c*x])]))/x^3
```

Maple [A]
time = 0.65, size = 488, normalized size = 1.40

method	result
derivativedivides	$c^3\left(-d^3a^2\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)+\frac{2d^3b^2c^3x^3}{27}-\frac{d^3b^2}{3cx}-\frac{50d^3b^2cx}{9}-\frac{17d^3b^2\arcsin(cx)\ln\left(1-icx-\right.}{3}\right.$
default	$c^3\left(-d^3a^2\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)+\frac{2d^3b^2c^3x^3}{27}-\frac{d^3b^2}{3cx}-\frac{50d^3b^2cx}{9}-\frac{17d^3b^2\arcsin(cx)\ln\left(1-icx-\right.}{3}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-d^3*a^2*(1/3*c^3*x^3-3*c*x+1/3/c^3/x^3-3/c/x)+2/27*d^3*b^2*c^3*x^3-1/
3*d^3*b^2/c/x-50/9*d^3*b^2*c*x-17/3*d^3*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^
2+1)^(1/2))+17/3*I*d^3*b^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+17/3*d^3*b^2
*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-17/3*I*d^3*b^2*polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))+3*d^3*b^2/c/x*arcsin(c*x)^2-1/3*d^3*b^2/c^3/x^3*arcsin
(c*x)^2-1/3*d^3*b^2*arcsin(c*x)^2*c^3*x^3+3*d^3*b^2*arcsin(c*x)^2*c*x-1/3*d
^3*b^2/c^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+50/9*d^3*b^2*arcsin(c*x)*(-c^
2*x^2+1)^(1/2)-2/9*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*d^3*a*b
*(1/3*c^3*x^3*arcsin(c*x)-3*c*x*arcsin(c*x)+1/3/c^3/x^3*arcsin(c*x)-3/c/x*a
rcsin(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-25/9*(-c^2*x^2+1)^(1/2)+1/6/c^2/x
^2*(-c^2*x^2+1)^(1/2)-17/6*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*a^2*c^6*d^3*x^3 - 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^6*d^3 + 3*b^2*c^4*d^3*x*arcsin(c*x)^2
 - 6*b^2*c^4*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + 3*a^2*c^4*d^3*x +
 6*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c^3*d^3 + 6*(c*log(2*sqrt(-c^
2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*c^2*d^3 - 1/3*((c^2*log(
2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c + 2*arc
sin(c*x)/x^3)*a*b*d^3 + 3*a^2*c^2*d^3/x - 1/3*a^2*d^3/x^3 - 1/3*(3*x^3*inte
grate(2/3*(b^2*c^7*d^3*x^6 - 9*b^2*c^3*d^3*x^2 + b^2*c*d^3)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 - x^3), x
) + (b^2*c^6*d^3*x^6 - 9*b^2*c^2*d^3*x^2 + b^2*d^3)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))^2)/x^3
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^4, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d^{3}\left(\int\left(-3a^{2}c^{4}\right)dx+\int\left(-\frac{a^{2}}{x^{4}}\right)dx+\int\frac{3a^{2}c^{2}}{x^{2}}dx+\int a^{2}c^{6}x^{2}dx+\int\left(-3b^{2}c^{4}\operatorname{asin}^{2}\left(cx\right)\right)dx+\int\left(-\frac{b^{2}\operatorname{asin}^{2}\left(cx\right)}{x^{4}}\right)dx+\int\left(-6abc^{4}\operatorname{asin}\left(cx\right)\right)dx+\int\left(-\frac{2ab\operatorname{asin}\left(cx\right)}{x^{4}}\right)dx+\int\frac{3b^{2}c^{2}\operatorname{asin}^{2}\left(cx\right)}{x^{2}}dx+\int b^{2}c^{6}x^{2}\operatorname{asin}^{2}\left(cx\right)dx+\int\frac{6abc^{2}\operatorname{asin}\left(cx\right)}{x^{2}}dx+\int 2abc^{6}x^{2}\operatorname{asin}\left(cx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] -d**3*(Integral(-3*a**2*c**4, x) + Integral(-a**2/x**4, x) + Integral(3*a**
2*c**2/x**2, x) + Integral(a**2*c**6*x**2, x) + Integral(-3*b**2*c**4*asin(
c*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**4, x) + Integral(-6*a*b*c**4*a
sin(c*x), x) + Integral(-2*a*b*asin(c*x)/x**4, x) + Integral(3*b**2*c**2*as
in(c*x)**2/x**2, x) + Integral(b**2*c**6*x**2*asin(c*x)**2, x) + Integral(6
*a*b*c**2*asin(c*x)/x**2, x) + Integral(2*a*b*c**6*x**2*asin(c*x), x))
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^3}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^4, x)
```

3.183 $\int \frac{x^4(a+b\mathbf{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=297

$$\frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^3d}-\frac{x(a+b\text{ArcSin}(cx))^2}{c^4d}$$

```
[Out] 22/9*b^2*x/c^4/d+2/27*b^2*x^3/c^2/d-x*(a+b*arcsin(c*x))^2/c^4/d-1/3*x^3*(a+
b*arcsin(c*x))^2/c^2/d-2*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1
/2))/c^5/d+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/c^5/d-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/
d-2*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d+2*b^2*polylog(3,I*(I
*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d-22/9*b*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
/c^5/d-2/9*b*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A]
time = 0.38, antiderivative size = 297, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4795, 4749, 4266, 2611, 2320, 6724, 4767, 8, 30}

$$-\frac{2i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{c^5d}+\frac{2ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^5d}-\frac{2ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^5d}-\frac{x(a+b\text{ArcSin}(cx))^2}{c^4d}-\frac{x^3(a+b\text{ArcSin}(cx))^2}{3c^2d}-\frac{22b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^3d}-\frac{2b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^5d}+\frac{2b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{c^5d}+\frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] (22*b^2*x)/(9*c^4*d) + (2*b^2*x^3)/(27*c^2*d) - (22*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(9*c^5*d) - (2*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(9*c^3*d) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d) - (x^3*(a + b*ArcSin[c*x])
^2)/(3*c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^
5*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^
5*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d
) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^5*d) + (2*b^2*PolyLog[3,
I*E^(I*ArcSin[c*x])])/(c^5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^4(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx &= -\frac{x^3(a+b\sin^{-1}(cx))^2}{3c^2d}+\frac{\int \frac{x^2(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx}{c^2}+\frac{(2b)\int \frac{x^3(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{3cd}\\
&= -\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^3d}-\frac{x(a+b\sin^{-1}(cx))^2}{c^4d}-\frac{x^3(a+b\sin^{-1}(cx))}{3c^2d}\\
&= \frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^3d}-\\
&= \frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{9c^3d}\\
&= \frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{9c^3d}\\
&= \frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{9c^3d}\\
&= \frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{9c^3d}
\end{aligned}
$$

Mathematica [A]
time = 0.53, size = 508, normalized size = 1.71

$$
-\frac{108a^2cx-270b^2cx+36a^2c^3x^3+264ab\sqrt{1-c^2x^2}+24abc^2x^2\sqrt{1-c^2x^2}+108i ab\pi \text{ArcSin}(cx)+216abcx\text{ArcSin}(cx)+72abc^3x^3\text{ArcSin}(cx)+270b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+135b^2cx\text{ArcSin}(cx)^2-6b^2\text{ArcSin}(cx)\cos(3\text{ArcSin}(cx))-108ab\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-216ab\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-108b^2\text{ArcSin}(cx)^2\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-108ab\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+216ab\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+108b^2\text{ArcSin}(cx)^2\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+54a^2\log(1-cx)-54a^2\log(1+cx)+108ab\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+108ab\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-216ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+216ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)+216b^2\text{PolyLog}\left(3,-ie^{i\text{ArcSin}(cx)}\right)-216b^2\text{PolyLog}\left(3,ie^{i\text{ArcSin}(cx)}\right)+2b^2\sin(3\text{ArcSin}(cx))-9b^2\text{ArcSin}(cx)^2\sin(3\text{ArcSin}(cx))}{108c^5d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -1/108*(108*a^2*c*x - 270*b^2*c*x + 36*a^2*c^3*x^3 + 264*a*b*Sqrt[1 - c^2*x
^2] + 24*a*b*c^2*x^2*Sqrt[1 - c^2*x^2] + (108*I)*a*b*Pi*ArcSin[c*x] + 216*a
*b*c*x*ArcSin[c*x] + 72*a*b*c^3*x^3*ArcSin[c*x] + 270*b^2*Sqrt[1 - c^2*x^2]
*ArcSin[c*x] + 135*b^2*c*x*ArcSin[c*x]^2 - 6*b^2*ArcSin[c*x]*Cos[3*ArcSin[c
*x]] - 108*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 216*a*b*ArcSin[c*x]*Log[1
- I*E^(I*ArcSin[c*x])] - 108*b^2*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])]
 - 108*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 216*a*b*ArcSin[c*x]*Log[1 + I*
E^(I*ArcSin[c*x])] + 108*b^2*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 5
4*a^2*Log[1 - c*x] - 54*a^2*Log[1 + c*x] + 108*a*b*Pi*Log[-Cos[(Pi + 2*ArcS
```

```
in[c*x])/4]] + 108*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (216*I)*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (216*I)*b*(a + b*ArcSi
n[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] + 216*b^2*PolyLog[3, (-I)*E^(I*ArcS
in[c*x])] - 216*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])] + 2*b^2*Sin[3*ArcSin[c*
x]] - 9*b^2*ArcSin[c*x]^2*Sin[3*ArcSin[c*x]])/(c^5*d)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^4(a+b\arcsin{(cx)})^2}{-c^2d\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/6*a^2*(2*(c^2*x^3 + 3*x)/(c^4*d) - 3*log(c*x + 1)/(c^5*d) + 3*log(c*x -
1)/(c^5*d)) + 1/6*(6*c^5*d*integrate(-1/3*(6*a*b*c^4*x^4*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)) - (3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)*log(c*x + 1) - 3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x
+ 1) - 2*(b^2*c^3*x^3 + 3*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d*x^2 - c^4*d), x) + 3*b^2*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*b^2*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(b^2*c^3*x^3 + 3*b^2*c*x)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/(c^5*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^2*d*
x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x^4}{c^2x^2-1}\,dx + \int \frac{b^2x^4\operatorname{asin}^2{(cx)}}{c^2x^2-1}\,dx + \int \frac{2abx^4\operatorname{asin}{(cx)}}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**4/(c**2*x**2 - 1), x) + Integral(b**2*x**4*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**4*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.184 $\int \frac{x^3(a+b\text{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=210

$$\frac{b^2x^2}{4c^2d}-\frac{bx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2c^3d}+\frac{(a+b\text{ArcSin}(cx))^2}{4c^4d}-\frac{x^2(a+b\text{ArcSin}(cx))^2}{2c^2d}+\frac{i(a+b\text{ArcSin}(cx))^3}{3bc^4d}$$

```
[Out] 1/4*b^2*x^2/c^2/d+1/4*(a+b*arcsin(c*x))^2/c^4/d-1/2*x^2*(a+b*arcsin(c*x))^2
/c^2/d+1/3*I*(a+b*arcsin(c*x))^3/b/c^4/d-(a+b*arcsin(c*x))^2*ln(1+(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/c^4/d+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^
2+1)^(1/2))^2)/c^4/d-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d
-1/2*b*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A]
time = 0.27, antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4795, 4765, 3800, 2221, 2611, 2320, 6724, 4737, 30}

$$\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^4d}+\frac{i(a+b\text{ArcSin}(cx))^3}{3bc^4d}+\frac{(a+b\text{ArcSin}(cx))^2}{4c^4d}-\frac{\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{c^4d}-\frac{x^2(a+b\text{ArcSin}(cx))^2}{2c^2d}-\frac{bx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2c^3d}-\frac{b^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2c^4d}+\frac{b^2x^2}{4c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] (b^2*x^2)/(4*c^2*d) - (b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c^3*d)
 + (a + b*ArcSin[c*x])^2/(4*c^4*d) - (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d)
+ ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d) - ((a + b*ArcSin[c*x])^2*Log[1 +
E^((2*I)*ArcSin[c*x])])/(c^4*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((
2*I)*ArcSin[c*x])])/(c^4*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c
^4*d)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx = -\frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d} + \frac{\int \frac{x(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx}{c^2} + \frac{b\int \frac{x^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{cd}$$

$$= -\frac{bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c^3d} - \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d} + \text{Subst}\left(\int (a+bx)^2 \right.$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c^3d} + \frac{(a+b\sin^{-1}(cx))^2}{4c^4d} - \frac{x^2(a+b\sin^{-1}(}{2c^2d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c^3d} + \frac{(a+b\sin^{-1}(cx))^2}{4c^4d} - \frac{x^2(a+b\sin^{-1}(}{2c^2d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c^3d} + \frac{(a+b\sin^{-1}(cx))^2}{4c^4d} - \frac{x^2(a+b\sin^{-1}(}{2c^2d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c^3d} + \frac{(a+b\sin^{-1}(cx))^2}{4c^4d} - \frac{x^2(a+b\sin^{-1}(}{2c^2d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c^3d} + \frac{(a+b\sin^{-1}(cx))^2}{4c^4d} - \frac{x^2(a+b\sin^{-1}(}{2c^2d}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 459 vs. 2(210) = 420.
time = 0.25, size = 459, normalized size = 2.19

$$-\frac{12a^2c^2x^2+12abcx\sqrt{1-c^2x^2}+48iab\pi\text{ArcSin}(cx)+24abc^2x^2\text{ArcSin}(cx)-24iab\text{ArcSin}(cx)^2-8ib^2\text{ArcSin}(cx)^3-24ab\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)+3b^2\cos(2\text{ArcSin}(cx))-6b^2\text{ArcSin}(cx)^2\cos(2\text{ArcSin}(cx))+96ab\pi\log\left(1+e^{-i\text{ArcSin}(cx)}\right)+24ab\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right)+48ab\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-24ab\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+48ab\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+24b^2\text{ArcSin}(cx)^2\log\left(1+e^{2i\text{ArcSin}(cx)}\right)+12a^2\log\left(1-c^2x^2\right)-96ab\pi\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)+24ab\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-24ab\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-48iab\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)-48iab\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)-24ib^2\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)+12b^2\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(cx)}\right)+6b^2\text{ArcSin}(cx)\sin(2\text{ArcSin}(cx))}{24c^4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -1/24*(12*a^2*c^2*x^2 + 12*a*b*c*x*Sqrt[1 - c^2*x^2] + (48*I)*a*b*Pi*ArcSin
[c*x] + 24*a*b*c^2*x^2*ArcSin[c*x] - (24*I)*a*b*ArcSin[c*x]^2 - (8*I)*b^2*A
rcSin[c*x]^3 - 24*a*b*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])] + 3*b^2*Cos[2*
ArcSin[c*x]] - 6*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + 96*a*b*Pi*Log[1 + E
^((-I)*ArcSin[c*x])] + 24*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 48*a*b*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 24*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x]
)] + 48*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 24*b^2*ArcSin[c*x]^2
*Log[1 + E^((2*I)*ArcSin[c*x])] + 12*a^2*Log[1 - c^2*x^2] - 96*a*b*Pi*Log[C
os[ArcSin[c*x]/2]] + 24*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 24*a*b*P
```

```
i*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (48*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin
[c*x])] - (48*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - (24*I)*b^2*ArcSin[c*
x]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + 12*b^2*PolyLog[3, -E^((2*I)*ArcSin[
c*x])] + 6*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(c^4*d)
```

Maple [A]
time = 0.35, size = 380, normalized size = 1.81

method	result
derivativedivides	$\frac{-\frac{a^2c^2x^2}{2d}-\frac{a^2\ln(cx-1)}{2d}-\frac{a^2\ln(cx+1)}{2d}+\frac{iab\arcsin(cx)^2}{d}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{2d}-\frac{b^2\arcsin(cx)^2c^2x^2}{2d}+\frac{b^2\arcsin(cx)^2}{4d}+}{}$
default	$\frac{-\frac{a^2c^2x^2}{2d}-\frac{a^2\ln(cx-1)}{2d}-\frac{a^2\ln(cx+1)}{2d}+\frac{iab\arcsin(cx)^2}{d}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{2d}-\frac{b^2\arcsin(cx)^2c^2x^2}{2d}+\frac{b^2\arcsin(cx)^2}{4d}+}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-1/2*a^2/d*c^2*x^2-1/2*a^2/d*ln(c*x-1)-1/2*a^2/d*ln(c*x+1)+I*a*b/d*a
rcsin(c*x)^2-1/2*b^2/d*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-1/2*b^2/d*arcsin(
c*x)^2*c^2*x^2+1/4*b^2/d*arcsin(c*x)^2+1/4*b^2/d*c^2*x^2-1/8*b^2/d-b^2/d*ar
csin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^2/d*arcsin(c*x)*polylog(
2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/
2))^2)/d+1/3*I*b^2/d*arcsin(c*x)^3-1/2*a*b/d*(-c^2*x^2+1)^(1/2)*c*x-a*b/d*a
rcsin(c*x)*c^2*x^2+1/2*a*b/d*arcsin(c*x)-2*a*b/d*arcsin(c*x)*ln(1+(I*c*x+(-
c^2*x^2+1)^(1/2))^2)+I*a*b/d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(x^2/(c^2*d) + log(c^2*x^2 - 1)/(c^4*d)) - 1/2*(b^2*c^2*x^2*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*c^4*d*integrate((2*a*b*c^3*x^3*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*c^2*x^2*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*l
og(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))
*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^5*d*x^2 - c^3*d), x) + b^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2*log(-c*x + 1))/(c^4*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)/(c^2*d*
x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x^3}{c^2x^2-1}\,dx + \int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx^3\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**3/(c**2*x**2 - 1), x) + Integral(b**2*x**3*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**3*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^3/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(a+b\,\mathrm{asin}(c\,x)\right)}^2}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.185 $\int \frac{x^2(a+b\textbf{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=218

$$\frac{2b^2x}{c^2d}-\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c^3d}-\frac{x(a+b\text{ArcSin}(cx))^2}{c^2d}-\frac{2i(a+b\text{ArcSin}(cx))^2\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{c^3d}+\frac{2i$$

```
[Out] 2*b^2*x/c^2/d-x*(a+b*arcsin(c*x))^2/c^2/d-2*I*(a+b*arcsin(c*x))^2*arctan(I*
c*x+(-c^2*x^2+1)^(1/2))/c^3/d+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/c^3/d-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*
x^2+1)^(1/2)))/c^3/d-2*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d+2
*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d-2*b*(a+b*arcsin(c*x))*(-
c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A]

time = 0.20, antiderivative size = 218, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4795, 4749, 4266, 2611, 2320, 6724, 4767, 8}

$$-\frac{2i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{c^3d}+\frac{2ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3d}-\frac{2ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3d}-\frac{x(a+b\text{ArcSin}(cx))^2}{c^2d}-\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c^3d}-\frac{2b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^3d}+\frac{2b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{c^3d}+\frac{2b^2x}{c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] (2*b^2*x)/(c^2*d) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^3*d) - (
x*(a + b*ArcSin[c*x])^2)/(c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/(c^3*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c^3*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^3*d) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^3*d) +
 (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx = -\frac{x(a+b\sin^{-1}(cx))^2}{c^2d} + \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx}{c^2} + \frac{(2b)\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{cd}$$

$$= -\frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d} - \frac{x(a+b\sin^{-1}(cx))^2}{c^2d} + \frac{\text{Subst}\left(\int (a+bx)^2 \sec\right.}{c^3}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d} - \frac{x(a+b\sin^{-1}(cx))^2}{c^2d} - \frac{2i(a+b\sin^{-1}(c}{}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d} - \frac{x(a+b\sin^{-1}(cx))^2}{c^2d} - \frac{2i(a+b\sin^{-1}(c}{}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d} - \frac{x(a+b\sin^{-1}(cx))^2}{c^2d} - \frac{2i(a+b\sin^{-1}(c}{}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d} - \frac{x(a+b\sin^{-1}(cx))^2}{c^2d} - \frac{2i(a+b\sin^{-1}(c}{}$$

Mathematica [A]
time = 0.20, size = 317, normalized size = 1.45

$$-\frac{2a^2cx - 4b^2cx + 4ab\sqrt{1-c^2x^2} + 4abcx\text{ArcSin}(cx) + 4b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx) + 2b^2cx\text{ArcSin}(cx)^2 - 4ab\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right) - 2b^2\text{ArcSin}(cx)^2\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 4ab\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + 2b^2\text{ArcSin}(cx)^2\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + a^2\log(1-cx) - a^2\log(1+cx) - 4ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right) + 4ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right) + 4b^2\text{PolyLog}\left(3,-ie^{i\text{ArcSin}(cx)}\right) - 4b^2\text{PolyLog}\left(3,ie^{i\text{ArcSin}(cx)}\right)}{2c^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -1/2*(2*a^2*c*x - 4*b^2*c*x + 4*a*b*Sqrt[1 - c^2*x^2] + 4*a*b*c*x*ArcSin[c*
x] + 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 2*b^2*c*x*ArcSin[c*x]^2 - 4*a*b*
ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b^2*ArcSin[c*x]^2*Log[1 - I*E^
(I*ArcSin[c*x])] + 4*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b^2*A
rcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + a^2*Log[1 - c*x] - a^2*Log[1 +
c*x] - (4*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*
I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] + 4*b^2*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])] - 4*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d)
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a+b\arcsin(cx))^2}{-c^2d\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(2*x/(c^2*d) - log(c*x + 1)/(c^3*d) + log(c*x - 1)/(c^3*d)) - 1/2*
(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - 2*c^3*d*integrate
(-(2*a*b*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (2*b^2*c*x*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - b^2*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d*x^2 - c^2*d), x) - b^
2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) + b^2*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1))/(c^3*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^2*d*
x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x^2}{c^2x^2-1}\,dx + \int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx^2\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**2/(c**2*x**2 - 1), x) + Integral(b**2*x**2*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**2*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.186 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=117

$$\frac{i(a+b\text{ArcSin}(cx))^3}{3bc^2d}-\frac{(a+b\text{ArcSin}(cx))^2\log\left(1+e^{2i\text{ArcSin}(cx)}\right)}{c^2d}+\frac{ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(c}\right.}{c^2d}$$

```
[Out] 1/3*I*(a+b*arcsin(c*x))^3/b/c^2/d-(a+b*arcsin(c*x))^2*ln(1+(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/c^2/d+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))^2)/c^2/d-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^2/d
```

Rubi [A]
time = 0.13, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4765, 3800, 2221, 2611, 2320, 6724}

$$\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^2d}+\frac{i(a+b\text{ArcSin}(cx))^3}{3bc^2d}-\frac{\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{c^2d}-\frac{b^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^2*d) - ((a + b*ArcSin[c*x])^2*Log[1 + E^
((2*I)*ArcSin[c*x])])/(c^2*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c^2*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^2
*d)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx = \frac{\text{Subst}\left(\int (a+bx)^2\tan(x)\,dx, x, \sin^{-1}(cx)\right)}{c^2d}$$

$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1+e^{2ix}}\,dx, x, \sin^{-1}(cx)\right)}{c^2d}$$

$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{(2b)\text{Subst}\left(\int (a+\right.}{}$$

$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{ib\left(a+b\sin^{-1}(cx\right.}{}$$

$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{ib\left(a+b\sin^{-1}(cx\right.}{}$$

$$= \frac{i\left(a+b\sin^{-1}(cx)\right)^3}{3bc^2d} - \frac{\left(a+b\sin^{-1}(cx)\right)^2\log\left(1+e^{2i\sin^{-1}(cx)}\right)}{c^2d} + \frac{ib\left(a+b\sin^{-1}(cx\right.}{}$$

Mathematica [A]

time = 0.06, size = 143, normalized size = 1.22

$$\frac{6iab\text{ArcSin}(cx)^2+2ib^2\text{ArcSin}(cx)^3-12ab\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-6b^2\text{ArcSin}(cx)^2\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-3a^2\log\left(1-c^2x^2\right)+6ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)-3b^2\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(cx)}\right)}{6c^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] ((6*I)*a*b*ArcSin[c*x]^2 + (2*I)*b^2*ArcSin[c*x]^3 - 12*a*b*ArcSin[c*x]*Log
[1 + E^((2*I)*ArcSin[c*x])] - 6*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c
*x])] - 3*a^2*Log[1 - c^2*x^2] + (6*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^
((2*I)*ArcSin[c*x])] - 3*b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(6*c^2*d)
```

Maple [A]
time = 0.08, size = 235, normalized size = 2.01

method	result
derivativedivides	$-\frac{a^2\ln(cx-1)}{2d}-\frac{a^2\ln(cx+1)}{2d}+\frac{ib^2\arcsin(cx)^3}{3d}-\frac{b^2\arcsin(cx)^2\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}+\frac{ib^2\arcsin(cx)\operatorname{polylog}\left(2,-\left(\right.\right.}{}$
default	$-\frac{a^2\ln(cx-1)}{2d}-\frac{a^2\ln(cx+1)}{2d}+\frac{ib^2\arcsin(cx)^3}{3d}-\frac{b^2\arcsin(cx)^2\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}+\frac{ib^2\arcsin(cx)\operatorname{polylog}\left(2,-\left(\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/2*a^2/d*ln(c*x-1)-1/2*a^2/d*ln(c*x+1)+1/3*I*b^2/d*arcsin(c*x)^3-b
^2/d*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^2/d*arcsin(c*x)*p
olylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/d+I*a*b/d*arcsin(c*x)^2-2*a*b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))^2)+I*a*b/d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*log(c^2*d*x^2 - d)/(c^2*d) - 1/2*(b^2*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))^2*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1))^2*log(-c*x + 1) + 2*c^2*d*integrate((2*a*b*c*x*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + (b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*
x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*sqrt
(c*x + 1)*sqrt(-c*x + 1))/(c^3*d*x^2 - c*d), x))/(c^2*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x}{c^2x^2-1}\,dx + \int \frac{b^2x\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x/(c**2*x**2 - 1), x) + Integral(b**2*x*asin(c*x)**2/(c**2*x**2 - 1), x) + Integral(2*a*b*x*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\left(a+b\operatorname{asin}(c\,x)\right)}^2}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.187 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=156

$$-\frac{2i(a+b\text{ArcSin}(cx))^2\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{cd}+\frac{2ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)}{cd}-\frac{2ib(a+b\text{ArcS}}{}$$

```
[Out] -2*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/d+2*I*b*(a+b*ar
csin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d-2*I*b*(a+b*arcsin(c
*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d-2*b^2*polylog(3,-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))/c/d+2*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d
```

Rubi [A]
time = 0.09, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4749, 4266, 2611, 2320, 6724}

$$-\frac{2i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{cd}+\frac{2ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{cd}-\frac{2ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{cd}-\frac{2b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{cd}+\frac{2b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2),x]
```

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + ((2*I)*b*(
a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - ((2*I)*b*(a
+ b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d) - (2*b^2*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(c*d) + (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(
c*d)
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx &= \frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{cd}\\
&= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd}-\frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx,\right.}{cd}\\
&= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd}+\frac{2ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd}\\
&= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd}+\frac{2ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd}\\
&= -\frac{2i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd}+\frac{2ib\left(a+b\sin^{-1}(cx)\right)\text{Li}_2\left(-ie^{i\sin^{-1}(cx)}\right)}{cd}
\end{aligned}$$

Mathematica [A]
time = 0.26, size = 207, normalized size = 1.33

$$\frac{-4ib^2\text{ArcSin}(cx)^2\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)+4ab\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-4ab\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)-a^2\log(1-cx)+a^2\log(1+cx)+4ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)-4ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)-4b^2\text{PolyLog}\left(3,-ie^{i\text{ArcSin}(cx)}\right)+4b^2\text{PolyLog}\left(3,ie^{i\text{ArcSin}(cx)}\right)}{2cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2),x]
```

```
[Out] ((-4*I)*b^2*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] + 4*a*b*ArcSin[c*x]*Log
[1 - I*E^(I*ArcSin[c*x])] - 4*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])]
- a^2*Log[1 - c*x] + a^2*Log[1 + c*x] + (4*I)*b*(a + b*ArcSin[c*x])*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I
*ArcSin[c*x])] - 4*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 4*b^2*PolyLog[3
, I*E^(I*ArcSin[c*x])])/(2*c*d)
```

Maple [A]
time = 0.16, size = 375, normalized size = 2.40

method	result
derivativedivides	$\frac{\frac{b^2 \arcsin(cx)^2 \ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-\frac{2ib^2 \arcsin(cx)\,\mathrm{polylog}\left(2,i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{2b^2\,\mathrm{polylog}\left(3,i\left(i\right.\right.}{}}{}$
default	$\frac{\frac{b^2 \arcsin(cx)^2 \ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-\frac{2ib^2 \arcsin(cx)\,\mathrm{polylog}\left(2,i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{2b^2\,\mathrm{polylog}\left(3,i\left(i\right.\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(1/d*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/d*b^2*arc
sin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2/d*b^2*polylog(3,I*(I*c*x
+(-c^2*x^2+1)^(1/2)))-1/d*b^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+2*I/d*b^2*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2/d*b^2*
polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d*arcsin(c*x)*ln(1-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-2*I/d*a*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*
b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I/d*a*b*polylog(2,-I*(
I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/d*a^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(log(c*x + 1)/(c*d) - log(c*x - 1)/(c*d)) + 1/2*(b^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2*log(-c*x + 1) + 2*c*d*integrate(-(2*a*b*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) - (b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))*log(c*x + 1) - b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x +
 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^2 - d), x))/(c*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^2x^2-1}\,dx + \int \frac{b^2\,\mathrm{asin}^2\,(cx)}{c^2x^2-1}\,dx + \int \frac{2ab\,\mathrm{asin}\,(cx)}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**2 - 1), x) + Integral(b**2*asin(c*x)**2/(c**2*x**2
 - 1), x) + Integral(2*a*b*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2), x)
```

3.188 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x(d-c^2dx^2)}\,dx$

Optimal. Leaf size=131

$$-\frac{2(a+b\text{ArcSin}(cx))^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)}{d}+\frac{ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)}{d}-\frac{ib(a+b\text{ArcSi}}{}$$

```
[Out] -2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+I*b*(a+b*arc
sin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-I*b*(a+b*arcsin(c*x))*
polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x
^2+1)^(1/2))^2)/d+1/2*b^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d
```

Rubi [A]
time = 0.14, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4769, 4504, 4268, 2611, 2320, 6724}

$$\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d}-\frac{b^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d}+\frac{b^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (-2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + (I*b*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d - (I*b*(a + b*ArcSin[c*x]
)*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c
*x])])/(2*d) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)}\,dx = \frac{\text{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx, x, \sin^{-1}(cx)\right)}{d}$$

$$= \frac{2\text{Subst}\left(\int (a+bx)^2\csc(2x)\,dx, x, \sin^{-1}(cx)\right)}{d}$$

$$= -\frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d} - \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,d\right.}{d}$$

$$= -\frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d} + \frac{ib(a+b\sin^{-1}(cx))\,\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{d}$$

$$= -\frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d} + \frac{ib(a+b\sin^{-1}(cx))\,\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{d}$$

$$= -\frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}(cx)}\right)}{d} + \frac{ib(a+b\sin^{-1}(cx))\,\text{Li}_2\left(-e^{2i\sin^{-1}(cx)}\right)}{d}$$

Mathematica [A]
time = 0.13, size = 254, normalized size = 1.94

$$\frac{-ib^2\pi^3+16ib^2\text{ArcSin}(cx)^3+24b^2\text{ArcSin}(cx)^2\log\left(1-e^{-2i\text{ArcSin}(cx)}\right)+48ab\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-48ab\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-24b^2\text{ArcSin}(cx)^2\log\left(1+e^{2i\text{ArcSin}(cx)}\right)+24a^2\log(cx)-12a^2\log\left(1-c^2x^2\right)+24ib^2\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(cx)}\right)+24ib(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)-24iab\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)+12b^2\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(cx)}\right)-12b^2\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(cx)}\right)}{24d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)),x]
```

```
[Out] ((-I)*b^2*Pi^3 + (16*I)*b^2*ArcSin[c*x]^3 + 24*b^2*ArcSin[c*x]^2*Log[1 - E^
((-2*I)*ArcSin[c*x])] + 48*a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
 48*a*b*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - 24*b^2*ArcSin[c*x]^2*L
og[1 + E^((2*I)*ArcSin[c*x])] + 24*a^2*Log[c*x] - 12*a^2*Log[1 - c^2*x^2] +
 (24*I)*b^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (24*I)*b*(a +
b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (24*I)*a*b*PolyLog[2, E
^((2*I)*ArcSin[c*x])] + 12*b^2*PolyLog[3, E^((-2*I)*ArcSin[c*x])] - 12*b^2*
PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(24*d)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 474 vs. $2(175) = 350$.
time = 0.15, size = 475, normalized size = 3.63

method	result
derivativedivides	$-\frac{a^2\ln(cx+1)}{2d} - \frac{a^2\ln(cx-1)}{2d} + \frac{a^2\ln(cx)}{d} + \frac{b^2\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)}{d} + \frac{iab\,\mathrm{dilog}\left(1+\left(icx\cdots\right.\right.}{\cdots}$
default	$-\frac{a^2\ln(cx+1)}{2d} - \frac{a^2\ln(cx-1)}{2d} + \frac{a^2\ln(cx)}{d} + \frac{b^2\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)}{d} + \frac{iab\,\mathrm{dilog}\left(1+\left(icx\cdots\right.\right.}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2/d*ln(c*x+1)-1/2*a^2/d*ln(c*x-1)+a^2/d*ln(c*x)+b^2/d*arcsin(c*x)^2*
ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b^2/d*arcsin(c*x)*polylog(2,I*c*x+(-c^2*
x^2+1)^(1/2))+2*b^2/d*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+b^2/d*arcsin(c*x
)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*b^2/d*arcsin(c*x)*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)+2*b^2/d*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-b^2/d*arcs
in(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*a*b/d*dilog(1-(I*c*x+(-c^2*x
^2+1)^(1/2))^2)-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+2*a*b/d*
arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*a*b/d*arcsin(c*x)*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))^2)+I*a*b/d*dilog(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*
I*b^2/d*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(log(c*x + 1)/d + log(c*x - 1)/d - 2*log(x)/d) - integrate((b^2*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))/(c^2*d*x^3 - d*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^3 - d*x),
x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^2x^3-x}\,dx + \int \frac{b^2 \operatorname{asin}^2{(cx)}}{c^2x^3-x}\,dx + \int \frac{2ab\operatorname{asin}{(cx)}}{c^2x^3-x}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d),x)
[Out] -(Integral(a**2/(c**2*x**3 - x), x) + Integral(b**2*asin(c*x)**2/(c**2*x**3
 - x), x) + Integral(2*a*b*asin(c*x)/(c**2*x**3 - x), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\operatorname{asin}(c\,x)\right)}^2}{x\,\left(d-c^2\,d\,x^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)), x)
```

3.189 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d-c^2dx^2)}\,dx$

Optimal. Leaf size=238

$$-\frac{(a+b\text{ArcSin}(cx))^2}{dx}-\frac{2ic(a+b\text{ArcSin}(cx))^2\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{d}-\frac{4bc(a+b\text{ArcSin}(cx))\tanh^{-1}\left(e^{i\text{ArcSin}(cx}\right.}{d}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/x-2*I*c*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1
)^(1/2))/d-4*b*c*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d+2*I*
b^2*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d+2*I*b*c*(a+b*arcsin(c*x))*poly
log(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-2*I*b*c*(a+b*arcsin(c*x))*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-2*I*b^2*c*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))/d-2*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d+2*b^2*c*polylog(3,I
*(I*c*x+(-c^2*x^2+1)^(1/2)))/d
```

Rubi [A]
time = 0.24, antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.370$, Rules used = {4789, 4749, 4266, 2611, 2320, 6724, 4803, 4268, 2317, 2438}

$$-\frac{2ic\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d}+\frac{2ibc\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{2ibc\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{(a+b\text{ArcSin}(cx))^2}{dx}-\frac{4bc\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}+\frac{2ib^2c\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{d}-\frac{2ib^2c\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{d}-\frac{2b^2c\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{d}+\frac{2b^2c\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])^2/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/d - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/
d + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c*(a + b*ArcS
in[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c*(a + b*ArcSin[c
*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcS
in[c*x])])/d - (2*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c*Po
lyLog[3, I*E^(I*ArcSin[c*x])])/d
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)}\,dx &= -\frac{(a+b\sin^{-1}(cx))^2}{dx}+c^2\int \frac{(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx+\frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d}\\
&= -\frac{(a+b\sin^{-1}(cx))^2}{dx}+\frac{c\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{d}+\frac{(2bc)\text{Subst}(\cdots}{\cdots}\\
&= -\frac{(a+b\sin^{-1}(cx))^2}{dx}-\frac{2ic(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc(a+b\sin^{-1}\cdots}{\cdots}\\
&= -\frac{(a+b\sin^{-1}(cx))^2}{dx}-\frac{2ic(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc(a+b\sin^{-1}\cdots}{\cdots}\\
&= -\frac{(a+b\sin^{-1}(cx))^2}{dx}-\frac{2ic(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc(a+b\sin^{-1}\cdots}{\cdots}\\
&= -\frac{(a+b\sin^{-1}(cx))^2}{dx}-\frac{2ic(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d}-\frac{4bc(a+b\sin^{-1}\cdots}{\cdots}
\end{aligned}
$$

Mathematica [A]
time = 0.44, size = 391, normalized size = 1.64

$$
-\frac{\frac{2a^2}{x}+a^2c\log(1-cx)-a^2c\log(1+cx)+4abc\left(\frac{\text{ArcSin}(cx)}{cx}-\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-\log\left(\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-i\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+i\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)\right)+2b^2c\left(\frac{\text{ArcSin}(cx)^2}{cx}-2\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\text{ArcSin}(cx)^2\log\left(1-ie^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)^2\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+2\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)-2i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-2i\text{ArcSin}(cx)\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+2i\text{ArcSin}(cx)\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)+2i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)+2\text{PolyLog}\left(3,-ie^{i\text{ArcSin}(cx)}\right)-2\text{PolyLog}\left(3,ie^{i\text{ArcSin}(cx)}\right)\right)}{2d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*((2*a^2)/x + a^2*c*Log[1 - c*x] - a^2*c*Log[1 + c*x] + 4*a*b*c*(ArcSin
[c*x]/(c*x) - ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1
+ I*E^(I*ArcSin[c*x])] + Log[Cos[ArcSin[c*x]/2]] - Log[Sin[ArcSin[c*x]/2]]
```

```
- I*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + I*PolyLog[2, I*E^(I*ArcSin[c*x])])
 + 2*b^2*c*(ArcSin[c*x]^2/(c*x) - 2*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]
- ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + I*E^(I
*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (2*I)*PolyLog[2
, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
] + (2*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + (2*I)*PolyLog[2, E^
(I*ArcSin[c*x])] + 2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 2*PolyLog[3, I*E^
(I*ArcSin[c*x])]))/d
```

Maple [A]

time = 0.27, size = 569, normalized size = 2.39

method	result
derivativedivides	$c\left(-\frac{a^2}{dcx}+\frac{a^2\ln(cx+1)}{2d}-\frac{a^2\ln(cx-1)}{2d}-\frac{b^2\arcsin(cx)^2}{dcx}+\frac{2ib^2\arcsin(cx)\operatorname{polylog}\left(2,-i\left(icx+\sqrt{-c^2x^2+1}\right.\right.}{d}\right.$
default	$c\left(-\frac{a^2}{dcx}+\frac{a^2\ln(cx+1)}{2d}-\frac{a^2\ln(cx-1)}{2d}-\frac{b^2\arcsin(cx)^2}{dcx}+\frac{2ib^2\arcsin(cx)\operatorname{polylog}\left(2,-i\left(icx+\sqrt{-c^2x^2+1}\right.\right.}{d}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c*(-a^2/d/c/x+1/2*a^2/d*ln(c*x+1)-1/2*a^2/d*ln(c*x-1)-b^2/d/c/x*arcsin(c*x)
^2-2*I*a*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*b^2/d*arcsin(c*x)*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2/d*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/d*
b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*b^2/d*dilog(I*c*x+
(-c^2*x^2+1)^(1/2))+2/d*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/d*b^2
*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I/d*b^2*arcsin(c*x)*pol
ylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2/d*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))-2*a*b/d*arcsin(c*x)/c/x+2*a*b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2
*x^2+1)^(1/2)))-2*a*b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*
b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-2*a*b/d*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2
*I*a*b/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/d*b^2*arcsin(c*x)*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(c*log(c*x + 1)/d - c*log(c*x - 1)/d - 2/(d*x)) + 1/2*(b^2*c*x*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - b^2*c*x*arctan2(c*x
```

```
, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*b^2*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1))^2 + 2*d*x*integrate(-(2*a*b*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) - (b^2*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))*log(c*x + 1) - b^2*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*lo
g(-c*x + 1) - 2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*
x + 1)*sqrt(-c*x + 1))/(c^2*d*x^4 - d*x^2), x))/(d*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^4 - d*x^2)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^2x^4-x^2}\,dx+\int \frac{b^2\operatorname{asin}^2(cx)}{c^2x^4-x^2}\,dx+\int \frac{2ab\operatorname{asin}(cx)}{c^2x^4-x^2}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d),x)
[Out] -(Integral(a**2/(c**2*x**4 - x**2), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**4 - x**2), x) + Integral(2*a*b*asin(c*x)/(c**2*x**4 - x**2), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\operatorname{asin}\left(c\,x\right)\right)}^2}{x^2\,\left(d-c^2\,d\,x^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)), x)
```

3.190 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^3(d-c^2dx^2)}\,dx$

Optimal. Leaf size=210

$$-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{dx}-\frac{(a+b\text{ArcSin}(cx))^2}{2dx^2}-\frac{2c^2(a+b\text{ArcSin}(cx))^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)}{d}+\frac{b^2c^2\,\text{lo}}{d}$$

```
[Out] -1/2*(a+b*arcsin(c*x))^2/d/x^2-2*c^2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c
^2*x^2+1)^(1/2))^2)/d+b^2*c^2*ln(x)/d+I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-
(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-I*b*c^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+
(-c^2*x^2+1)^(1/2))^2)/d-1/2*b^2*c^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^
2)/d+1/2*b^2*c^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-b*c*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/d/x
```

Rubi [A]
time = 0.27, antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4789, 4769, 4504, 4268, 2611, 2320, 6724, 4771, 29}

$$\frac{ibc^2\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{ibc^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{dx}-\frac{2c^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d}-\frac{(a+b\text{ArcSin}(cx))^2}{2dx^2}-\frac{b^2c^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d}+\frac{b^2c^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)}{2d}+\frac{b^2c^2\log(x)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x)) - (a + b*ArcSin[c*x])^
2/(2*d*x^2) - (2*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/
d + (b^2*c^2*Log[x])/d + (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*
ArcSin[c*x])])/d - (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[
c*x])])/d - (b^2*c^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d) + (b^2*c^2*P
olyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^3(d-c^2dx^2)}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{2dx^2}+c^2\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)}\,dx+\frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{x^2\sqrt{1-c^2x^2}}\,dx}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{dx}-\frac{(a+b\sin^{-1}(cx))^2}{2dx^2}+\frac{c^2\text{Subst}\left(\int (a+bx)^2\csc(x\right.}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{dx}-\frac{(a+b\sin^{-1}(cx))^2}{2dx^2}+\frac{b^2c^2\log(x)}{d}+\frac{(2c^2)\,\text{Subst}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{dx}-\frac{(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{2c^2(a+b\sin^{-1}(cx))^2\tan}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{dx}-\frac{(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{2c^2(a+b\sin^{-1}(cx))^2\tan}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{dx}-\frac{(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{2c^2(a+b\sin^{-1}(cx))^2\tan}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{dx}-\frac{(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{2c^2(a+b\sin^{-1}(cx))^2\tan}{d}$$

Mathematica [A]
time = 0.79, size = 353, normalized size = 1.68

$$-\frac{\frac{a^2}{x^2}-2a^2c^2\log(x)+a^2c^2\log(1-c^2x^2)+2abc^2\left(\frac{\sqrt{1-c^2x^2}}{cx}+\frac{\text{ArcSin}(cx)}{c^2x^2}-2\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+2\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)+i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)+2b^2c^2\left(\frac{i\pi^3}{24}+\frac{\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{cx}+\frac{\text{ArcSin}(cx)^2}{2c^2x^2}-\frac{2}{3}i\text{ArcSin}(cx)^3-\text{ArcSin}(cx)^2\log\left(1-e^{-2i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)^2\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-\log(cx)-i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(cx)}\right)-i\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{2}\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(cx)}\right)+\frac{1}{2}\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(cx)}\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*(a^2/x^2 - 2*a^2*c^2*Log[x] + a^2*c^2*Log[1 - c^2*x^2] + 2*a*b*c^2*(Sq
rt[1 - c^2*x^2]/(c*x) + ArcSin[c*x]/(c^2*x^2) - 2*ArcSin[c*x]*Log[1 - E^((2
*I)*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - I*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])] + I*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 2*b^2
*c^2*((I/24)*Pi^3 + (Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]^2/(
2*c^2*x^2) - ((2*I)/3)*ArcSin[c*x]^3 - ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcS
in[c*x])] + ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - Log[c*x] - I*Arc
Sin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - I*ArcSin[c*x]*PolyLog[2, -E^(
(2*I)*ArcSin[c*x])] - PolyLog[3, E^((-2*I)*ArcSin[c*x])]/2 + PolyLog[3, -E^
((2*I)*ArcSin[c*x])]/2))/d
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 740 vs. $2(250) = 500$.
time = 0.43, size = 741, normalized size = 3.53

method	result
derivativedivides	$c^2\left(\frac{ib^2\arcsin(cx)}{d}+\frac{iab}{d}-\frac{a^2}{2d\,c^2x^2}+\frac{ib^2\arcsin(cx)\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}-\frac{b^2\arcsin(cx)^2}{2d\,c^2x^2}\right.$
default	$c^2\left(\frac{ib^2\arcsin(cx)}{d}+\frac{iab}{d}-\frac{a^2}{2d\,c^2x^2}+\frac{ib^2\arcsin(cx)\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d}-\frac{b^2\arcsin(cx)^2}{2d\,c^2x^2}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(I*a*b/d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*a*b/d*arcsin(c*x)*l
n(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^2/d*arcsin(c*x)*polylog(2,-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)-1/2*a^2/d/c^2/x^2+I*b^2/d*arcsin(c*x)+2*a*b/d*arcsin(c*
x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/2*b^2/d*arcsin(c*x)^2/c^2/x^2-2*I*a*b/d
*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*a*b/d*polylog(2,I*c*x+(-c^2*x^2+1
)^(1/2))-b^2/d*arcsin(c*x)/c/x*(-c^2*x^2+1)^(1/2)+b^2/d*ln(I*c*x+(-c^2*x^2+
1)^(1/2)-1)-2*b^2/d*ln(I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d*ln(1+I*c*x+(-c^2*x^2
+1)^(1/2))-b^2/d*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*a^2/d
*ln(c*x-1)-1/2*a^2/d*ln(c*x+1)+a^2/d*ln(c*x)+2*b^2/d*polylog(3,-I*c*x-(-c^2
*x^2+1)^(1/2))+2*b^2/d*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d*arcsin(c*x
)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2
+1)^(1/2))-a*b/d/c/x*(-c^2*x^2+1)^(1/2)-a*b/d*arcsin(c*x)/c^2/x^2-2*I*b^2/d
*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b^2/d*arcsin(c*x)*poly
log(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*a*b/d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1
)^(1/2))-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+I*a*b/d)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*(c^2*log(c*x + 1)/d + c^2*log(c*x - 1)/d - 2*c^2*log(x)/d + 1/(d*x^2))
*a^2 - integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^2*d*x^5 - d*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^5 - d*x^3)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^2x^5-x^3}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^2x^5-x^3}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^2x^5-x^3}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**5 - x**3), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**5 - x**3), x) + Integral(2*a*b*asin(c*x)/(c**2*x**5 - x**3), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2}{x^3\,(d-c^2\,d\,x^2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)), x)
```

3.191 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4(d-c^2dx^2)}\,dx$

Optimal. Leaf size=333

$$-\frac{b^2c^2}{3dx}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3dx^2}-\frac{(a+b\text{ArcSin}(cx))^2}{3dx^3}-\frac{c^2(a+b\text{ArcSin}(cx))^2}{dx}-\frac{2ic^3(a+b\text{ArcSin}(cx$$

```
[Out] -1/3*b^2*c^2/d/x-1/3*(a+b*arcsin(c*x))^2/d/x^3-c^2*(a+b*arcsin(c*x))^2/d/x-
2*I*c^3*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d-14/3*b*c^3*(
a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d+7/3*I*b^2*c^3*polylog(
2,-I*c*x-(-c^2*x^2+1)^(1/2))/d+2*I*b*c^3*(a+b*arcsin(c*x))*polylog(2,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))/d-2*I*b*c^3*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/d-7/3*I*b^2*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))/d-2
*b^2*c^3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d+2*b^2*c^3*polylog(3,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/d-1/3*b*c*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d
/x^2
```

Rubi [A]
time = 0.45, antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4789, 4749, 4266, 2611, 2320, 6724, 4803, 4268, 2317, 2438, 30}

$$-\frac{2ic^3\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d}+\frac{2ibc^3\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{2ibc^3\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}-\frac{14bc^3\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3dx^2}-\frac{c^2(a+b\text{ArcSin}(cx))^2}{dx}-\frac{(a+b\text{ArcSin}(cx))^2}{3dx^3}+\frac{7ib^2c^3\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{3d}-\frac{7ib^2c^3\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{3d}-\frac{2b^2c^3\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{d}+\frac{2b^2c^3\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{d}-\frac{b^2c^2}{3dx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -1/3*(b^2*c^2)/(d*x) - (b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*d*x^2
) - (a + b*ArcSin[c*x])^2/(3*d*x^3) - (c^2*(a + b*ArcSin[c*x])^2)/(d*x) - (
(2*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d - (14*b*c^3*(a
 + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d) + (((7*I)/3)*b^2*c^3*Po
lyLog[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2,
 I*E^(I*ArcSin[c*x])])/d - (((7*I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])]
)/d - (2*b^2*c^3*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c^3*PolyLog
[3, I*E^(I*ArcSin[c*x])])/d
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^4(d-c^2dx^2)}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{3dx^3} + c^2\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x^3\sqrt{1-c^2x^2}}\,dx}{3d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3} - \frac{c^2(a+b\sin^{-1}(cx))^2}{dx} + c$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3} - \frac{c^2(a+b\sin^{-1}(c}{dx}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3} - \frac{c^2(a+b\sin^{-1}(c}{dx}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3} - \frac{c^2(a+b\sin^{-1}(c}{dx}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3} - \frac{c^2(a+b\sin^{-1}(c}{dx}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3} - \frac{c^2(a+b\sin^{-1}(c}{dx}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than

twice the leaf count of optimal. 849 vs. $2(333) = 666$.
time = 7.16, size = 849, normalized size = 2.55

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -1/3*a^2/(d*x^3) - (a^2*c^2)/(d*x) - (a^2*c^3*Log[1 - c*x])/(2*d) + (a^2*c^
3*Log[1 + c*x])/(2*d) - (2*a*b*(-(c^2*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1
- c^2*x^2]])) + (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sq
rt[1 - c^2*x^2]])/(6*x^3) + (c^4*((((3*I)/2)*Pi*ArcSin[c*x])/c - ((I/2)*Arc
Sin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi*Log[1 + I*E^(I
*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c - (2*Pi*
Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c - ((2
*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c))/2 - (c^4*(((I/2)*Pi*ArcSin[c*x]
)/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c + (P
i*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*
x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(Pi + 2*ArcSin[c*x
])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/2))/d - (b^2*c^3*(4
*Cot[ArcSin[c*x]/2] + 14*ArcSin[c*x]^2*Cot[ArcSin[c*x]/2] + 2*ArcSin[c*x]*C
sc[ArcSin[c*x]/2]^2 + (c*x*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^4)/2 - 56*ArcSi
n[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 24*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[
c*x])] + 24*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 56*ArcSin[c*x]*Log
[1 + E^(I*ArcSin[c*x])] - (56*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (48*I)*Ar
cSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (48*I)*ArcSin[c*x]*PolyLog[2
, I*E^(I*ArcSin[c*x])] + (56*I)*PolyLog[2, E^(I*ArcSin[c*x])] + 48*PolyLog[
3, (-I)*E^(I*ArcSin[c*x])] - 48*PolyLog[3, I*E^(I*ArcSin[c*x])] - 2*ArcSin[
c*x]*Sec[ArcSin[c*x]/2]^2 + (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3
) + 4*Tan[ArcSin[c*x]/2] + 14*ArcSin[c*x]^2*Tan[ArcSin[c*x]/2]))/(24*d)
```

Maple [A]
time = 0.36, size = 691, normalized size = 2.08

method	result
derivativedivides	$c^3\left(-\frac{2ab\arcsin(cx)}{dcx}-\frac{b^2}{3dcx}-\frac{b^2\arcsin(cx)^2}{dcx}-\frac{a^2}{3d\,c^3x^3}-\frac{ab\sqrt{-c^2x^2+1}}{3d\,c^2x^2}-\frac{2ab\arcsin(cx)}{3d\,c^3x^3}-\frac{b^2\arcsin(c\right.$
default	$c^3\left(-\frac{2ab\arcsin(cx)}{dcx}-\frac{b^2}{3dcx}-\frac{b^2\arcsin(cx)^2}{dcx}-\frac{a^2}{3d\,c^3x^3}-\frac{ab\sqrt{-c^2x^2+1}}{3d\,c^2x^2}-\frac{2ab\arcsin(cx)}{3d\,c^3x^3}-\frac{b^2\arcsin(c\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(2/d*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d*arcsin(c*x)/c/
x-1/3*b^2/d/c/x-b^2/d/c/x*arcsin(c*x)^2+7/3*I*b^2/d*dilog(I*c*x+(-c^2*x^2+1
)^(1/2))+7/3*I*b^2/d*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/3*a^2/d/c^3/x^3-1/
3*a*b/d/c^2/x^2*(-c^2*x^2+1)^(1/2)-2/3*a*b/d*arcsin(c*x)/c^3/x^3-1/3*b^2/d/
c^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/3*b^2/d/c^3/x^3*arcsin(c*x)^2-2*a*
b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d*arcsin(c*x)*ln(1
-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*a*b/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2
)))-2*I*a*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-a^2/d/c/x-7/3*b^2/d*arc
sin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+7/3*a*b/d*ln(I*c*x+(-c^2*x^2+1)^(1/
2)-1)-7/3*a*b/d*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/2*a^2/d*ln(c*x-1)+1/2*a^2/
d*ln(c*x+1)-2*I/d*b^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2
/d*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I/d*b^2*arcsin(c*x)*polyl
og(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/d*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))-1/d*b^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/6*(3*c^3*log(c*x + 1)/d - 3*c^3*log(c*x - 1)/d - 2*(3*c^2*x^2 + 1)/(d*x^3
))*a^2 + 1/6*(3*b^2*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*lo
g(c*x + 1) - 3*b^2*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log
(-c*x + 1) + 6*d*x^3*integrate(-1/3*(6*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)) - (3*b^2*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(
c*x + 1) - 3*b^2*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*
x + 1) - 2*(3*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^6 - d*x^4), x) - 2*(3*b^2*c^2*
x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/(d*x^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^6 - d*x^4)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^2x^6-x^4}\,dx + \int \frac{b^2\operatorname{asin}^2{(cx)}}{c^2x^6-x^4}\,dx + \int \frac{2ab\operatorname{asin}{(cx)}}{c^2x^6-x^4}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2/(c**2*x**6 - x**4), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**6 - x**4), x) + Integral(2*a*b*asin(c*x)/(c**2*x**6 - x**4), x))/d
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^4), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x^4\,\left(d-c^2\,d\,x^2\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)), x)
```

3.192 $\int \frac{x^4(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=300

$$-\frac{2b^2x}{c^4d^2}-\frac{b(a+b\text{ArcSin}(cx))}{c^5d^2\sqrt{1-c^2x^2}}+\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c^5d^2}+\frac{3x(a+b\text{ArcSin}(cx))^2}{2c^4d^2}+\frac{x^3(a+b\text{ArcSin}(cx)}{2c^2d^2\,(1-c^2x^2)}$$

```
[Out] -2*b^2*x/c^4/d^2+3/2*x*(a+b*arcsin(c*x))^2/c^4/d^2+1/2*x^3*(a+b*arcsin(c*x)
)^2/c^2/d^2/(-c^2*x^2+1)+3*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^
(1/2))/c^5/d^2+b^2*arctanh(c*x)/c^5/d^2-3*I*b*(a+b*arcsin(c*x))*polylog(2,-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2+3*I*b*(a+b*arcsin(c*x))*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2+3*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))/c^5/d^2-3*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2-b*(a+b
*arcsin(c*x))/c^5/d^2/(-c^2*x^2+1)^(1/2)+2*b*(a+b*arcsin(c*x))*(-c^2*x^2+1)
^(1/2)/c^5/d^2
```

Rubi [A]

time = 0.37, antiderivative size = 300, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 14, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.518$, Rules used = {4791, 4795, 4749, 4266, 2611, 2320, 6724, 4767, 8, 272, 45, 4779, 396, 214}

$$\frac{3i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{c^5d^2}-\frac{3ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^5d^2}+\frac{3ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^5d^2}+\frac{3x(a+b\text{ArcSin}(cx))^2}{2c^4d^2}+\frac{x^3(a+b\text{ArcSin}(cx))^2}{2c^2d^2\,(1-c^2x^2)}+\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c^5d^2}-\frac{b(a+b\text{ArcSin}(cx))}{c^5d^2\sqrt{1-c^2x^2}}+\frac{3b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^5d^2}-\frac{3b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{c^5d^2}+\frac{b^2\tanh^{-1}(cx)}{c^5d^2}-\frac{2b^2x}{c^4d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] (-2*b^2*x)/(c^4*d^2) - (b*(a + b*ArcSin[c*x]))/(c^5*d^2*Sqrt[1 - c^2*x^2])
+ (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d^2) + (3*x*(a + b*ArcSi
n[c*x])^2)/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^
2)) + ((3*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^2) + (
b^2*ArcTanh[c*x])/(c^5*d^2) - ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])])/(c^5*d^2) + ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E
^(I*ArcSin[c*x])])/(c^5*d^2) + (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(
c^5*d^2) - (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{x^3(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^3(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{cd^2} - \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{c^5d^2\sqrt{1-c^2x^2}} - \frac{b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d^2} + \frac{3x(a+b\sin^{-1}(cx))^2}{2c^4d^2} +$$

$$= \frac{b^2x}{c^4d^2} - \frac{b(a+b\sin^{-1}(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d^2} + \frac{3x(a+b\sin^{-1}(c}{2c^4d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\sin^{-1}(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d^2} + \frac{3x(a+b\sin^{-1}}{2c^4d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\sin^{-1}(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d^2} + \frac{3x(a+b\sin^{-1}}{2c^4d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\sin^{-1}(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d^2} + \frac{3x(a+b\sin^{-1}}{2c^4d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\sin^{-1}(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d^2} + \frac{3x(a+b\sin^{-1}}{2c^4d^2}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 971 vs. $2(300) = 600$.
time = 5.02, size = 971, normalized size = 3.24

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] (4*a^2*c*x + 8*a*b*Sqrt[1 - c^2*x^2] + (2*a*b*Sqrt[1 - c^2*x^2])/(-1 + c*x)
 - (2*a*b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2*a^2*c*x)/(-1 + c^2*x^2) + (4*b^
2*c*x)/(-1 + c^2*x^2) + (6*I)*a*b*Pi*ArcSin[c*x] + 8*a*b*c*x*ArcSin[c*x] -
(2*a*b*ArcSin[c*x])/(-1 + c*x) - (2*a*b*ArcSin[c*x])/(1 + c*x) + (2*b^2*Arc
Sin[c*x])/Sqrt[1 - c^2*x^2] + (4*b^2*c*x*ArcSin[c*x]^2)/(1 - c^2*x^2) + (4*
b^2*c*x*Cos[2*ArcSin[c*x]])/(-1 + c^2*x^2) + (2*b^2*c*x*ArcSin[c*x]^2*Cos[2
*ArcSin[c*x]])/(1 - c^2*x^2) + (2*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]])/(1 -
c^2*x^2) - 6*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 12*a*b*ArcSin[c*x]*Log[1
```

```
 - I*E^(I*ArcSin[c*x])] - 6*b^2*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])]
- 6*b^2*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I/
2)*ArcSin[c*x]))] - 6*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c
*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b^2*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSi
n[c*x])] + 6*b^2*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E
^((I/2)*ArcSin[c*x])] - 6*b^2*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(
I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] - 6*b^2*ArcSin[c*x]^2*Log[((1 + I)
+ (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] + 3*a^2*Log[1 - c*x
] - 3*a^2*Log[1 + c*x] + 6*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 6*b^2
*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 4*b^2*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]] - 6*b^2*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2]] + 4*b^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] +
6*b^2*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 6*a*b*Pi
*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + 6*b^2*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*Ar
cSin[c*x])/4]] - (12*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c
*x])] + (12*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] + 12*b
^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 12*b^2*PolyLog[3, I*E^(I*ArcSin[c*x
])])/(4*c^5*d^2)
```

Maple [A]
time = 0.50, size = 640, normalized size = 2.13

method	result
derivativedivides	$-\frac{a^2}{4d^2(cx-1)}+\frac{2ab\arcsin(cx)cx}{d^2}+\frac{2ab\sqrt{-c^2x^2+1}}{d^2}+\frac{2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2}+\frac{a^2cx}{d^2}-\frac{2b^2cx}{d^2}-\frac{3a^2\ln(cx+1)}{4d^2}+\frac{3a^2}{}$
default	$-\frac{a^2}{4d^2(cx-1)}+\frac{2ab\arcsin(cx)cx}{d^2}+\frac{2ab\sqrt{-c^2x^2+1}}{d^2}+\frac{2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2}+\frac{a^2cx}{d^2}-\frac{2b^2cx}{d^2}-\frac{3a^2\ln(cx+1)}{4d^2}+\frac{3a^2}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-1/4*a^2/d^2/(c*x-1)+2*a*b/d^2*arcsin(c*x)*c*x+2*a*b/d^2*(-c^2*x^2+1
)^(1/2)+2*b^2/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-3/2*b^2/d^2*arcsin(c*x)^2*
ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-2*I*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+a^2/d^2*c
*x-2*b^2/d^2*c*x-3/4*a^2/d^2*ln(c*x+1)+3/4*a^2/d^2*ln(c*x-1)-1/4*a^2/d^2/(c
*x+1)-3*b^2/d^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*b^2/d^2*polylog(3
,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c*x-a
*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+3
*a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*a*b/d^2*arcsin(c*
x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*I*a*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^
2+1)^(1/2)))+3*I*a*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b^2/d^2*arcs
in(c*x)^2*c*x+b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+3*I*b^2/d^
```

```
2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*I*b^2/d^2*arcsin(c*
x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*x/(c^6*d^2*x^2 - c^4*d^2) - 4*x/(c^4*d^2) + 3*log(c*x + 1)/(c^5
*d^2) - 3*log(c*x - 1)/(c^5*d^2)) - 1/4*(3*(b^2*c^2*x^2 - b^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*(b^2*c^2*x^2 - b^2)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(2*b^2*c^3*x^3 -
3*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^7*d^2*x^2 -
c^5*d^2)*integrate(-1/2*(4*a*b*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) - (3*(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*
log(c*x + 1) - 3*(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))*log(-c*x + 1) - 2*(2*b^2*c^3*x^3 - 3*b^2*c*x)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^8*d^2*x^4 - 2*c^6*d^2*
x^2 + c^4*d^2), x))/(c^7*d^2*x^2 - c^5*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2x^4}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^4\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^4\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**4/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**4*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**4*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.193 $\int \frac{x^3(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=227

$$-\frac{bx(a+b\text{ArcSin}(cx))}{c^3d^2\sqrt{1-c^2x^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{2c^4d^2}+\frac{x^2(a+b\text{ArcSin}(cx))^2}{2c^2d^2(1-c^2x^2)}-\frac{i(a+b\text{ArcSin}(cx))^3}{3bc^4d^2}+\frac{(a+b\text{ArcSin}(cx$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2/c^4/d^2+1/2*x^2*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x
^2+1)-1/3*I*(a+b*arcsin(c*x))^3/b/c^4/d^2+(a+b*arcsin(c*x))^2*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))^2)/c^4/d^2-1/2*b^2*ln(-c^2*x^2+1)/c^4/d^2-I*b*(a+b*arcsi
n(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d^2+1/2*b^2*polylog(3,
-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d^2-b*x*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*
x^2+1)^(1/2)
```

Rubi [A]
time = 0.28, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4791, 4765, 3800, 2221, 2611, 2320, 6724, 4737, 266}

$$-\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^4d^2}-\frac{i(a+b\text{ArcSin}(cx))^3}{3bc^4d^2}+\frac{(a+b\text{ArcSin}(cx))^2}{2c^4d^2}+\frac{\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{c^4d^2}+\frac{x^2(a+b\text{ArcSin}(cx))^2}{2c^2d^2(1-c^2x^2)}-\frac{bx(a+b\text{ArcSin}(cx))}{c^3d^2\sqrt{1-c^2x^2}}+\frac{b^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2c^4d^2}-\frac{b^2\log(1-c^2x^2)}{2c^4d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*
x])^2/(2*c^4*d^2) + (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) -
 ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])^2*Log[1 +
 E^((2*I)*ArcSin[c*x])])/(c^4*d^2) - (b^2*Log[1 - c^2*x^2])/(2*c^4*d^2) - (
I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2) + (b^
2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^4*d^2)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^2(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{cd^2} - \frac{\int \frac{x(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx}{c^2d}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{\text{Subst}\left(\int (a+bx)^2\tan(x)\,dx, x,\right.}{c^4d^2}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin}{3bc^4}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin}{3bc^4}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin}{3bc^4}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin}{3bc^4}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2c^4d^2} + \frac{x^2(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\sin}{3bc^4}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 502 vs. $2(227) = 454$.
time = 0.71, size = 502, normalized size = 2.21

$$\frac{\frac{3ab\sqrt{1-c^2x^2}}{-1+cx} + \frac{3ab\sqrt{1-c^2x^2}}{1+cx} - \frac{3a^2}{-1+c^2x^2} + 12iab\pi\text{ArcSin}(cx) - \frac{3ab\text{ArcSin}(cx)}{-1+cx} + \frac{3ab\text{ArcSin}(cx)}{1+cx} - \frac{6b^2cx\text{ArcSin}(cx)}{\sqrt{1-c^2x^2}} - 6iab\text{ArcSin}(cx)^2 + \frac{3b^2\text{ArcSin}(cx)^2}{1-c^2x^2} - 2ib^2\text{ArcSin}(cx)^3 + 24ab\pi\log\left(1+e^{-i\text{ArcSin}(cx)}\right) + 6ab\pi\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 12ab\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right) - 6ab\pi\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + 12ab\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + 6b^2\text{ArcSin}(cx)^2\log\left(1+e^{2i\text{ArcSin}(cx)}\right) + 3a^2\log(1-c^2x^2) - 3b^2\log(1-c^2x^2) - 24ab\pi\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) + 6ab\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - 6ab\pi\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - 12iab\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right) - 12iab\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right) - 6ib^2\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right) + 3b^2\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(cx)}\right)}{6c^4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (3*a*b*Sqrt[1 - c^2*x^2])/(1 + c*x)
 - (3*a^2)/(-1 + c^2*x^2) + (12*I)*a*b*Pi*ArcSin[c*x] - (3*a*b*ArcSin[c*x])
/(-1 + c*x) + (3*a*b*ArcSin[c*x])/(1 + c*x) - (6*b^2*c*x*ArcSin[c*x])/Sqrt[
1 - c^2*x^2] - (6*I)*a*b*ArcSin[c*x]^2 + (3*b^2*ArcSin[c*x]^2)/(1 - c^2*x^2
) - (2*I)*b^2*ArcSin[c*x]^3 + 24*a*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 6*a
*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcS
```

```
in[c*x])] - 6*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c*x]*Log[
1 + I*E^(I*ArcSin[c*x])] + 6*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x]
)] + 3*a^2*Log[1 - c^2*x^2] - 3*b^2*Log[1 - c^2*x^2] - 24*a*b*Pi*Log[Cos[Ar
cSin[c*x]/2]] + 6*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 6*a*b*Pi*Log[S
in[(Pi + 2*ArcSin[c*x])/4]] - (12*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]
 - (12*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - (6*I)*b^2*ArcSin[c*x]*PolyL
og[2, -E^((2*I)*ArcSin[c*x])] + 3*b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(
6*c^4*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 533 vs. $2(243) = 486$.
time = 0.49, size = 534, normalized size = 2.35

method	result
derivativedivides	$\frac{\frac{a^2}{4d^2(cx+1)}+\frac{a^2\ln(cx+1)}{2d^2}-\frac{a^2}{4d^2(cx-1)}+\frac{a^2\ln(cx-1)}{2d^2}-\frac{ib^2\arcsin(cx)^3}{3d^2}-\frac{iab\,c^2x^2}{d^2\left(c^2x^2-1\right)}+\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{d^2\left(c^2x^2-1\right)}-\frac{b^2 \mathrm{ar}}{2d^2(}}{}$
default	$\frac{\frac{a^2}{4d^2(cx+1)}+\frac{a^2\ln(cx+1)}{2d^2}-\frac{a^2}{4d^2(cx-1)}+\frac{a^2\ln(cx-1)}{2d^2}-\frac{ib^2\arcsin(cx)^3}{3d^2}-\frac{iab\,c^2x^2}{d^2\left(c^2x^2-1\right)}+\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{d^2\left(c^2x^2-1\right)}-\frac{b^2 \mathrm{ar}}{2d^2(}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(1/4*a^2/d^2/(c*x+1)+1/2*a^2/d^2*ln(c*x+1)-1/4*a^2/d^2/(c*x-1)+1/2*a^
2/d^2*ln(c*x-1)-1/3*I*b^2/d^2*arcsin(c*x)^3-I*a*b/d^2/(c^2*x^2-1)*c^2*x^2+b
^2/d^2*arcsin(c*x)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c*x-1/2*b^2/d^2*arcsin(c*
x)^2/(c^2*x^2-1)-I*b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*c^2*x^2+b^2/d^2*arcsin(c
*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*b^2/d^2*arcsin(c*x)*polylog(2,-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^
2)/d^2-b^2/d^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*b^2/d^2*ln(I*c*x+(-c^2*
x^2+1)^(1/2))-I*a*b/d^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*a*b/d^2*
arcsin(c*x)^2+a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c*x-a*b/d^2*arcsin(c*x
)/(c^2*x^2-1)+I*a*b/d^2/(c^2*x^2-1)+2*a*b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))^2)+I*b^2/d^2*arcsin(c*x)/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(1/(c^6*d^2*x^2 - c^4*d^2) - log(c^2*x^2 - 1)/(c^4*d^2)) - 1/2*(b^
2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - (b^2*c^2*x^2 - b^2)*arctan
```

```
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - (b^2*c^2*x^2 - b^2)*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(c^6*d^2*x^2
- c^4*d^2)*integrate((2*a*b*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)) - (b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (b^2*c^2*x^2 - b^2)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (b^2*c^2*x^2 - b
^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*sqrt(c*x + 1)
*sqrt(-c*x + 1))/(c^7*d^2*x^4 - 2*c^5*d^2*x^2 + c^3*d^2), x))/(c^6*d^2*x^2
- c^4*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2x^3}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^3\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**3/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**3*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**3*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^3/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.194 $\int \frac{x^2(a+b\text{ArcSin}(cx))^2}{\left(d-c^2dx^2\right)^2} \, dx$

Optimal. Leaf size=233

$$-\frac{b(a+b\text{ArcSin}(cx))}{c^3d^2\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))^2}{2c^2d^2\left(1-c^2x^2\right)}+\frac{i(a+b\text{ArcSin}(cx))^2\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{c^3d^2}+\frac{b^2\tanh^{-1}(cx)}{c^3d^2}-\frac{ib(a$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x^2+1)+I*(a+b*arcsin(c*x))^2*arctan
(I*c*x+(-c^2*x^2+1)^(1/2))/c^3/d^2+b^2*arctanh(c*x)/c^3/d^2-I*b*(a+b*arcsin
(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^2+I*b*(a+b*arcsin(c*x
))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^2+b^2*polylog(3,-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))/c^3/d^2-b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^
3/d^2-b*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 233, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4791, 4749, 4266, 2611, 2320, 6724, 4767, 212}

$$\frac{i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{c^3d^2}-\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3d^2}+\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3d^2}+\frac{x(a+b\text{ArcSin}(cx))^2}{2c^2d^2\left(1-c^2x^2\right)}-\frac{b(a+b\text{ArcSin}(cx))}{c^3d^2\sqrt{1-c^2x^2}}+\frac{b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^3d^2}-\frac{b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{c^3d^2}+\frac{b^2\tanh^{-1}(cx)}{c^3d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c
*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) + (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*Ar
cSin[c*x])])/(c^3*d^2) + (b^2*ArcTanh[c*x])/(c^3*d^2) - (I*b*(a + b*ArcSin[
c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + (I*b*(a + b*ArcSin[c*
x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^2) + (b^2*PolyLog[3, (-I)*E^(I*
ArcSin[c*x])])/(c^3*d^2) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{x(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{cd^2} - \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \sin\right.}{2c^3d^2}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{c^3d^2}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{c^3d^2}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{c^3d^2}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\sin^{-1}(cx))^2\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{c^3d^2}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 727 vs. $2(233) = 466$.
time = 3.77, size = 727, normalized size = 3.12

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/4*((2*a^2*c*x)/(-1 + c^2*x^2) + (2*b^2*ArcSin[c*x]*(-2*Sqrt[1 - c^2*x^2]
 + c*x*ArcSin[c*x]))/(-1 + c^2*x^2) + (2*a*b*(1 - 2*Sqrt[1 - c^2*x^2] + Cos
[2*ArcSin[c*x]] + ArcSin[c*x]*(2*c*x - Log[1 - I*E^(I*ArcSin[c*x])] + Log[1
 + I*E^(I*ArcSin[c*x])] + Cos[2*ArcSin[c*x]]*(-Log[1 - I*E^(I*ArcSin[c*x])]
 + Log[1 + I*E^(I*ArcSin[c*x])]))))/(-1 + c^2*x^2) - a^2*Log[1 - c*x] + a^2
*Log[1 + c*x] + (4*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*a*b*Po
lyLog[2, I*E^(I*ArcSin[c*x])] + 2*b^2*(ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[
c*x])] + Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I
/2)*ArcSin[c*x]))] - ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] - ArcSin[c*
x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] + Pi
*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin
[c*x])] + ArcSin[c*x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/
2)*ArcSin[c*x]))] - Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*Lo
g[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + ArcSin[c*x]^2*Log[Cos[ArcSin[c
```

```
*x]/2] - Sin[ArcSin[c*x]/2]] - 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
]] - ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - Pi*ArcSin
[c*x]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (2*I)*ArcSin[c*x]*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*
PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 2*PolyLog[3, I*E^(I*ArcSin[c*x])]))/(c
^3*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 547 vs. $2(262) = 524$.
time = 0.32, size = 548, normalized size = 2.35

method	result
derivativedivides	$\frac{-\frac{a^2}{4d^2(cx+1)}-\frac{a^2\ln(cx+1)}{4d^2}-\frac{a^2}{4d^2(cx-1)}+\frac{a^2\ln(cx-1)}{4d^2}-\frac{b^2\arcsin(cx)^2cx}{2d^2(c^2x^2-1)}+\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2(c^2x^2-1)}-\frac{b^2\arcsin(cx)^2\ln\left(1\cdots\right.}{}}{}$
default	$\frac{-\frac{a^2}{4d^2(cx+1)}-\frac{a^2\ln(cx+1)}{4d^2}-\frac{a^2}{4d^2(cx-1)}+\frac{a^2\ln(cx-1)}{4d^2}-\frac{b^2\arcsin(cx)^2cx}{2d^2(c^2x^2-1)}+\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2(c^2x^2-1)}-\frac{b^2\arcsin(cx)^2\ln\left(1\cdots\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-1/4*a^2/d^2/(c*x+1)-1/4*a^2/d^2*ln(c*x+1)-1/4*a^2/d^2/(c*x-1)+1/4*a
^2/d^2*ln(c*x-1)-1/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c*x+b^2/d^2/(c^2*x^2
-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/2*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-2*I*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-b^2/d^2*p
olylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I*
c*x+(-c^2*x^2+1)^(1/2)))+I*a*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b^
2/d^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*b^2/d^2*arcsin(c*x)*polylo
g(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+a*b/
d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*
x^2+1)^(1/2)))-a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*b^2
/d^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*a*b/d^2*dilog(1+
I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*x/(c^4*d^2*x^2 - c^2*d^2) + log(c*x + 1)/(c^3*d^2) - log(c*x -
1)/(c^3*d^2)) - 1/4*(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
```

```
 + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x
 + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*lo
g(-c*x + 1) + 4*(c^5*d^2*x^2 - c^3*d^2)*integrate(-1/2*(4*a*b*c^2*x^2*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (2*b^2*c*x*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))*log(c*x + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^2*x^4 - 2*c
^4*d^2*x^2 + c^2*d^2), x))/(c^5*d^2*x^2 - c^3*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2x^2}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{2abx^2\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**2*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**2*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.195 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=89

$$-\frac{bx(a+b\text{ArcSin}(cx))}{cd^2\sqrt{1-c^2x^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{2c^2d^2(1-c^2x^2)}-\frac{b^2\log(1-c^2x^2)}{2c^2d^2}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x^2+1)-1/2*b^2*ln(-c^2*x^2+1)/c^2/d^2
-b*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {4767, 4745, 266}

$$-\frac{bx(a+b\text{ArcSin}(cx))}{cd^2\sqrt{1-c^2x^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{2c^2d^2(1-c^2x^2)}-\frac{b^2\log(1-c^2x^2)}{2c^2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*c^2*d^2*(1 - c^2*x^2)) - (b^2*Log[1 - c^2*x^2])/(2*c^2*d^2)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{a+b\sin^{-1}(cx)}{(1-c^2x^2)^{3/2}}\,dx}{cd^2}$$
$$= -\frac{bx(a+b\sin^{-1}(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{b^2\int \frac{x}{1-c^2x^2}\,dx}{d^2}$$
$$= -\frac{bx(a+b\sin^{-1}(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b^2\log(1-c^2x^2)}{2c^2d^2}$$

Mathematica [A]
time = 0.12, size = 75, normalized size = 0.84

$$-\frac{\frac{2bcx(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}} + \frac{(a+b\text{ArcSin}(cx))^2}{-1+c^2x^2} + b^2\log(1-c^2x^2)}{2c^2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*((2*b*c*x*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2] + (a + b*ArcSin[c*x])
^2/(-1 + c^2*x^2) + b^2*Log[1 - c^2*x^2])/(c^2*d^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 181 vs. 2(83) = 166.
time = 0.08, size = 182, normalized size = 2.04

method	result
derivativedivides	$\frac{-\frac{a^2}{2d^2(c^2x^2-1)} - \frac{b^2\arcsin(cx)^2}{2d^2(c^2x^2-1)} + \frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{d^2(c^2x^2-1)} - \frac{b^2\ln(-c^2x^2+1)}{2d^2} + \frac{2ab\left(-\frac{\arcsin(cx)}{2(c^2x^2-1)} + \frac{\sqrt{-(cx+}}{4}\right.}{}}{c^2}$
default	$\frac{-\frac{a^2}{2d^2(c^2x^2-1)} - \frac{b^2\arcsin(cx)^2}{2d^2(c^2x^2-1)} + \frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{d^2(c^2x^2-1)} - \frac{b^2\ln(-c^2x^2+1)}{2d^2} + \frac{2ab\left(-\frac{\arcsin(cx)}{2(c^2x^2-1)} + \frac{\sqrt{-(cx+}}{4}\right.}{}}{c^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/2*a^2/d^2/(c^2*x^2-1)-1/2*b^2/d^2*arcsin(c*x)^2/(c^2*x^2-1)+b^2/d
^2*arcsin(c*x)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c*x-1/2*b^2*ln(-c^2*x^2+1)/d^
```

```
2+2*a*b/d^2*(-1/2/(c^2*x^2-1)*arcsin(c*x)+1/4/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^
(1/2)+1/4/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 293 vs. $2(82) = 164$.
time = 0.51, size = 293, normalized size = 3.29

$$\frac{1}{2}\left(\left(\left(\frac{\sqrt{-c^2x^2+1}\,c^2d^2}{c^7d^4x+c^6d^4}+\frac{\sqrt{-c^2x^2+1}\,c^2d^2}{c^7d^4x-c^6d^4}\right)c^2-\frac{2\arcsin(cx)}{c^4d^2x^2-c^2d^2}\right)ab-\frac{1}{2}\left(c^3\left(\frac{\log(cx+1)}{c^5d^2}+\frac{\log(cx-1)}{c^5d^2}\right)-\left(\frac{\sqrt{-c^2x^2+1}\,c^2d^2}{c^7d^4x+c^6d^4}+\frac{\sqrt{-c^2x^2+1}\,c^2d^2}{c^7d^4x-c^6d^4}\right)c^2\arcsin(cx)\right)b^2-\frac{b^2\arcsin(cx)^2}{2\left(c^4d^2x^2-c^2d^2\right)}-\frac{a^2}{2\left(c^4d^2x^2-c^2d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*((sqrt(-c^2*x^2 + 1)*c^2*d^2/(c^7*d^4*x + c^6*d^4) + sqrt(-c^2*x^2 + 1)
*c^2*d^2/(c^7*d^4*x - c^6*d^4))*c^2 - 2*arcsin(c*x)/(c^4*d^2*x^2 - c^2*d^2)
)*a*b - 1/2*(c^3*(log(c*x + 1)/(c^5*d^2) + log(c*x - 1)/(c^5*d^2)) - (sqrt(
-c^2*x^2 + 1)*c^2*d^2/(c^7*d^4*x + c^6*d^4) + sqrt(-c^2*x^2 + 1)*c^2*d^2/(c
^7*d^4*x - c^6*d^4))*c^2*arcsin(c*x))*b^2 - 1/2*b^2*arcsin(c*x)^2/(c^4*d^2*
x^2 - c^2*d^2) - 1/2*a^2/(c^4*d^2*x^2 - c^2*d^2)
```

Fricas [A]
time = 2.67, size = 102, normalized size = 1.15

$$-\frac{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2+\left(b^2c^2x^2-b^2\right)\log\left(c^2x^2-1\right)-2\left(b^2cx\arcsin(cx)+abcx\right)\sqrt{-c^2x^2+1}}{2\left(c^4d^2x^2-c^2d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2 + (b^2*c^2*x^2 - b^2)*log
(c^2*x^2 - 1) - 2*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt(-c^2*x^2 + 1))/(c^4*
d^2*x^2 - c^2*d^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{a^2x}{c^4x^4-2c^2x^2+1}\,dx+\int\frac{b^2x\,\mathrm{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx+\int\frac{2abx\,\mathrm{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x*asin(c
*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x*asin(c*x)/(c**4
*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 204 vs. $2(82) = 164$.

time = 0.47, size = 204, normalized size = 2.29

$$-\frac{b^2x^2\arcsin(cx)^2}{2(c^2x^2-1)d^2}-\frac{abx^2\arcsin(cx)}{(c^2x^2-1)d^2}-\frac{a^2x^2}{2(c^2x^2-1)d^2}-\frac{b^2x\arcsin(cx)}{\sqrt{-c^2x^2+1}\,cd^2}+\frac{b^2\arcsin(cx)^2}{2c^2d^2}-\frac{abx}{\sqrt{-c^2x^2+1}\,cd^2}+\frac{ab\arcsin(cx)}{c^2d^2}-\frac{b^2\log(2)}{c^2d^2}-\frac{b^2\log(|-c^2x^2+1|)}{2c^2d^2}+\frac{a^2}{2c^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*b^2*x^2*arcsin(c*x)^2/((c^2*x^2 - 1)*d^2) - a*b*x^2*arcsin(c*x)/((c^2*
x^2 - 1)*d^2) - 1/2*a^2*x^2/((c^2*x^2 - 1)*d^2) - b^2*x*arcsin(c*x)/(sqrt(-
c^2*x^2 + 1)*c*d^2) + 1/2*b^2*arcsin(c*x)^2/(c^2*d^2) - a*b*x/(sqrt(-c^2*x^
2 + 1)*c*d^2) + a*b*arcsin(c*x)/(c^2*d^2) - b^2*log(2)/(c^2*d^2) - 1/2*b^2*
log(abs(-c^2*x^2 + 1))/(c^2*d^2) + 1/2*a^2/(c^2*d^2)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.196 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=230

$$-\frac{b(a+b\text{ArcSin}(cx))}{cd^2\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))^2}{2d^2(1-c^2x^2)}-\frac{i(a+b\text{ArcSin}(cx))^2\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{cd^2}+\frac{b^2\tanh^{-1}(cx)}{cd^2}+\frac{ib(a$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)-I*(a+b*arcsin(c*x))^2*arctan(I*c
*x+(-c^2*x^2+1)^(1/2))/c/d^2+b^2*arctanh(c*x)/c/d^2+I*b*(a+b*arcsin(c*x))*p
olylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-I*b*(a+b*arcsin(c*x))*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)
^(1/2)))/c/d^2+b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-b*(a+b*arc
sin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4747, 4749, 4266, 2611, 2320, 6724, 4767, 212}

$$-\frac{i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{cd^2}-\frac{b(a+b\text{ArcSin}(cx))}{cd^2\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))^2}{2d^2(1-c^2x^2)}+\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{cd^2}-\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{cd^2}-\frac{b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{cd^2}+\frac{b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{cd^2}+\frac{b^2\tanh^{-1}(cx)}{cd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c*x
])^2)/(2*d^2*(1 - c^2*x^2)) - (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c
*x])])/(c*d^2) + (b^2*ArcTanh[c*x])/(c*d^2) + (I*b*(a + b*ArcSin[c*x])*Poly
Log[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - (I*b*(a + b*ArcSin[c*x])*PolyLog[
2, I*E^(I*ArcSin[c*x])])/(c*d^2) - (b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])
/(c*d^2) + (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c*d^2)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^2}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} + \frac{b^2\int \frac{1}{1-c^2x^2}\,dx}{d^2} + \frac{\text{Subst}\left(\int (a+bx)^2 \text{s}\right.}{2}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{cd^2\sqrt{1-c^2x^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{2d^2\left(1-c^2x^2\right)} - \frac{i\left(a+b\sin^{-1}(cx)\right)^2\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{cd^2}$$

Mathematica [A]
time = 1.44, size = 359, normalized size = 1.56

$$\frac{-\frac{2a^2x}{-1+c^2x^2}-\frac{a^2\log(1-cx)}{c}+\frac{a^2\log(1+cx)}{c}+\frac{2ab\left(\frac{2\left(-1+c^2x^2+\sqrt{1-c^2x^2}+\text{ArcSin}(cx)\left(-cx+\left(-1+c^2x^2\right)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)+\left(1-c^2x^2\right)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)\right)\right)}{-1+c^2x^2}+2i\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)-2i\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)\right)}{c}+\frac{4b^2\left(-\frac{\text{ArcSin}(cx)}{\sqrt{1-c^2x^2}}+\frac{cx\text{ArcSin}(cx)^2}{2-2c^2x^2}-i\text{ArcSin}(cx)^2\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)+\tanh^{-1}(cx)+i\text{ArcSin}(cx)\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)-i\text{ArcSin}(cx)\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)-\text{PolyLog}\left(3,-ie^{i\text{ArcSin}(cx)}\right)+\text{PolyLog}\left(3,ie^{i\text{ArcSin}(cx)}\right)\right)}{c}}{4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((-2*a^2*x)/(-1 + c^2*x^2) - (a^2*Log[1 - c*x])/c + (a^2*Log[1 + c*x])/c +
(2*a*b*((2*(-1 + c^2*x^2 + Sqrt[1 - c^2*x^2] + ArcSin[c*x]*(-(c*x) + (-1 +
c^2*x^2)*Log[1 - I*E^(I*ArcSin[c*x])] + (1 - c^2*x^2)*Log[1 + I*E^(I*ArcSin
[c*x])])))/(-1 + c^2*x^2) + (2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I
)*PolyLog[2, I*E^(I*ArcSin[c*x])]))/c + (4*b^2*(-(ArcSin[c*x]/Sqrt[1 - c^2*
x^2]) + (c*x*ArcSin[c*x]^2)/(2 - 2*c^2*x^2) - I*ArcSin[c*x]^2*ArcTan[E^(I*A
rcSin[c*x])] + ArcTanh[c*x] + I*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x
])] - I*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - PolyLog[3, (-I)*E^(I*
ArcSin[c*x])] + PolyLog[3, I*E^(I*ArcSin[c*x])]))/c)/(4*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 547 vs. $2(259) = 518$.
time = 0.16, size = 548, normalized size = 2.38

method	result
derivativedivides	$\frac{-\frac{a^2}{4d^2(cx+1)}+\frac{a^2\ln(cx+1)}{4d^2}-\frac{a^2}{4d^2(cx-1)}-\frac{a^2\ln(cx-1)}{4d^2}-\frac{b^2\arcsin(cx)^2cx}{2d^2(c^2x^2-1)}+\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2(c^2x^2-1)}+\frac{b^2\arcsin(cx)^2\ln\left(1\right.}{}}{}$
default	$\frac{-\frac{a^2}{4d^2(cx+1)}+\frac{a^2\ln(cx+1)}{4d^2}-\frac{a^2}{4d^2(cx-1)}-\frac{a^2\ln(cx-1)}{4d^2}-\frac{b^2\arcsin(cx)^2cx}{2d^2(c^2x^2-1)}+\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2(c^2x^2-1)}+\frac{b^2\arcsin(cx)^2\ln\left(1\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-1/4*a^2/d^2/(c*x+1)+1/4*a^2/d^2*ln(c*x+1)-1/4*a^2/d^2/(c*x-1)-1/4*a^2
/d^2*ln(c*x-1)-1/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c*x+b^2/d^2/(c^2*x^2-1
)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/2*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-
c^2*x^2+1)^(1/2)))-2*I*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d^2*pol
ylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I*c*
x+(-c^2*x^2+1)^(1/2)))-I*a*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-b^2/
d^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*b^2/d^2*arcsin(c*x)*polylog(
2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+a*b/d^
2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^
2+1)^(1/2)))+a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*b^2/d
^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*a*b/d^2*dilog(1+I*
(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*x/(c^2*d^2*x^2 - d^2) - log(c*x + 1)/(c*d^2) + log(c*x - 1)/(c*
d^2)) - 1/4*(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - (b^2*
c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) +
(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x +
 1) - 4*(c^3*d^2*x^2 - c*d^2)*integrate(1/2*(4*a*b*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) - (2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
- (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
1) + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*
x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2),
x))/(c^3*d^2*x^2 - c*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^4 - 2*c^2
*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2\,\mathrm{asin}^2\,(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2ab\,\mathrm{asin}\,(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*asin(c*x)*
*2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*asin(c*x)/(c**4*x**4
- 2*c**2*x**2 + 1), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}(c\,x)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^2, x)
```

3.197 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{x(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=211

$$-\frac{bcx(a+b\text{ArcSin}(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{2d^2\,(1-c^2x^2)}-\frac{2(a+b\text{ArcSin}(cx))^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)}{d^2}-\frac{b^2\log\left(1-c^2x^2\right)}{2d^2}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)-2*(a+b*arcsin(c*x))^2*arctanh((I*c
*x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b^2*ln(-c^2*x^2+1)/d^2+I*b*(a+b*arcsin(c*
x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-I*b*(a+b*arcsin(c*x))*poly
log(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/d^2+1/2*b^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-b*c*x
*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.22, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266}

$$-\frac{bcx(a+b\text{ArcSin}(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{2d^2\,(1-c^2x^2)}+\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d^2}-\frac{b^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d^2}+\frac{b^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{b^2\log\left(1-c^2x^2\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((b*c*x*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*d^2*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSi
n[c*x])])/d^2 - (b^2*Log[1 - c^2*x^2])/(2*d^2) + (I*b*(a + b*ArcSin[c*x])*P
olyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2
, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2
*d^2) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^2)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)^2}\,dx = \frac{(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{(1-c^2x^2)^{3/2}}\,dx}{d^2} + \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)}\,dx}{d}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} + \frac{\text{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx\right.}{d^2}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{b^2\log(1-c^2x^2)}{2d^2} + \frac{2\text{Subst}\left(\int (a+\right.}{}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}}\right.}{d^2}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}}\right.}{d^2}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}}\right.}{d^2}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{2i\sin^{-1}}\right.}{d^2}$$

Mathematica [A]
time = 0.88, size = 365, normalized size = 1.73

$$\frac{\frac{a^2}{1-c^2x^2}+2a^2\log(cx)-a^2\log(1-c^2x^2)+2ab\left(-\frac{cx}{\sqrt{1-c^2x^2}}+\frac{\text{ArcSin}(cx)}{1-c^2x^2}+2\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-2\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)+i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)-i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)+2b^2\left(-\frac{i\pi^3}{24}-\frac{cx\text{ArcSin}(cx)}{\sqrt{1-c^2x^2}}+\frac{\text{ArcSin}(cx)^2}{2-2c^2x^2}+\frac{2}{3}i\text{ArcSin}(cx)^3+\text{ArcSin}(cx)^2\log\left(1-e^{-2i\text{ArcSin}(cx)}\right)-\text{ArcSin}(cx)^2\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{2}\log(1-c^2x^2)+i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(cx)}\right)+i\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)+\frac{1}{2}\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(cx)}\right)-\frac{1}{2}\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(cx)}\right)\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] (a^2/(1 - c^2*x^2) + 2*a^2*Log[c*x] - a^2*Log[1 - c^2*x^2] + 2*a*b*(-((c*x)
/Sqrt[1 - c^2*x^2]) + ArcSin[c*x]/(1 - c^2*x^2) + 2*ArcSin[c*x]*Log[1 - E^(
(2*I)*ArcSin[c*x])] - 2*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] + I*Poly
Log[2, -E^((2*I)*ArcSin[c*x])] - I*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 2*b
^2*((-1/24*I)*Pi^3 - (c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + ArcSin[c*x]^2/(2
 - 2*c^2*x^2) + ((2*I)/3)*ArcSin[c*x]^3 + ArcSin[c*x]^2*Log[1 - E^((-2*I)*A
rcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - Log[1 - c^2*x
^2]/2 + I*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + I*ArcSin[c*x]*Po
```

```
lyLog[2, -E^((2*I)*ArcSin[c*x])] + PolyLog[3, E^((-2*I)*ArcSin[c*x])]/2 - P
olyLog[3, -E^((2*I)*ArcSin[c*x])]/2))/(2*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 828 vs. $2(249) = 498$.
time = 0.36, size = 829, normalized size = 3.93

method	result
derivativedivides	$-\frac{a^2}{4d^2(cx-1)} - \frac{b^2 \operatorname{polylog}\left(3, -\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{2d^2} - \frac{b^2 \ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d^2} + \frac{2b^2 \ln\left(ic\right.}{}$
default	$-\frac{a^2}{4d^2(cx-1)} - \frac{b^2 \operatorname{polylog}\left(3, -\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{2d^2} - \frac{b^2 \ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d^2} + \frac{2b^2 \ln\left(ic\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a^2/d^2/(c*x-1)-1/2*a^2/d^2*ln(c*x+1)-1/2*a^2/d^2*ln(c*x-1)+1/4*a^2/d^
2/(c*x+1)+2*b^2/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2))-b^2/d^2*ln(1+(I*c*x+(-c^2*
x^2+1)^(1/2))^2)+a^2/d^2*ln(c*x)+2*b^2/d^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1
/2))+2*b^2/d^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b^2/d^2*arcsin(c*x)*
polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*a*b/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2
*x^2+1)^(1/2))+I*a*b/d^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*a*b/d^2
*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*a*b/d^2*polylog(2,-I*c*x-(-
c^2*x^2+1)^(1/2))-2*I*a*b/d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d^2*a
rcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d^2*arcsin(c*x)^2*ln(1-I*c*
x-(-c^2*x^2+1)^(1/2))+b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c*
x-I*a*b/d^2/(c^2*x^2-1)*c^2*x^2+a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c*x-
I*b^2/d^2*arcsin(c*x)/(c^2*x^2-1)*c^2*x^2-1/2*b^2/d^2*arcsin(c*x)^2/(c^2*x^
2-1)-b^2/d^2*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*a*b/d^2/(c^
2*x^2-1)+I*b^2/d^2*arcsin(c*x)/(c^2*x^2-1)-a*b/d^2*arcsin(c*x)/(c^2*x^2-1)-
2*a*b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2*polylog(3,
-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-2*I*b^2/d^2*arcsin(c*x)*polylog(2,I*c*x+
(-c^2*x^2+1)^(1/2))+I*b^2/d^2*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(1/(c^2*d^2*x^2 - d^2) + log(c*x + 1)/d^2 + log(c*x - 1)/d^2 - 2*l
og(x)/d^2) + integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 +
```

```
2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^4*d^2*x^5 - 2*c^2*d^2*
x^3 + d^2*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^5 - 2*c^2
*d^2*x^3 + d^2*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2}{c^4x^5-2c^2x^3+x}\,dx+\int \frac{b^2\operatorname{asin}^2(cx)}{c^4x^5-2c^2x^3+x}\,dx+\int \frac{2ab\operatorname{asin}(cx)}{c^4x^5-2c^2x^3+x}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a**2/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(b**2*asin(c*x)*
*2/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(2*a*b*asin(c*x)/(c**4*x**5
- 2*c**2*x**3 + x), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x\,{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^2), x)
```

3.198 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=324

$$-\frac{bc(a+b\text{ArcSin}(cx))}{d^2\sqrt{1-c^2x^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{d^2x\,(1-c^2x^2)}+\frac{3c^2x(a+b\text{ArcSin}(cx))^2}{2d^2\,(1-c^2x^2)}-\frac{3ic(a+b\text{ArcSin}(cx))^2\text{ArcTan}\left(e^{i\text{ArcSi}}\right.}{d^2}$$

```
[Out] -(a+b*arcsin(c*x))^2/d^2/x/(-c^2*x^2+1)+3/2*c^2*x*(a+b*arcsin(c*x))^2/d^2/(
-c^2*x^2+1)-3*I*c*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-
4*b*c*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^2+b^2*c*arctanh
(c*x)/d^2+2*I*b^2*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d^2+3*I*b*c*(a+b*a
rcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-3*I*b*c*(a+b*arcsi
n(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-2*I*b^2*c*polylog(2,I*c
*x+(-c^2*x^2+1)^(1/2))/d^2-3*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/d^2+3*b^2*c*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-b*c*(a+b*arcsin(c*
x))/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.38, antiderivative size = 324, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 14, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.518$, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 4793, 4803, 4268, 2317, 2438}

$$-\frac{3ic\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d^2}-\frac{bc(a+b\text{ArcSin}(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{3c^2x(a+b\text{ArcSin}(cx))^2}{2d^2\,(1-c^2x^2)}-\frac{(a+b\text{ArcSin}(cx))^2}{d^2x\,(1-c^2x^2)}+\frac{3ibc\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{3ibc\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{4bc\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}+\frac{2ib^2c\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{d^2}-\frac{2ib^2c\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{d^2}-\frac{3b^2c\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{d^2}+\frac{3b^2c\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{d^2}+\frac{b^2c\tanh^{-1}(cx)}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) - (a + b*ArcSin[c*x])^
2/(d^2*x*(1 - c^2*x^2)) + (3*c^2*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x
^2)) - ((3*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (4*b
*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^2 + (b^2*c*ArcTanh[c*x
])/d^2 + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + ((3*I)*b*c*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - ((3*I)*b*c*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - ((2*I)*b^2*c*PolyLog[2
, E^(I*ArcSin[c*x])])/d^2 - (3*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d^
2 + (3*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x])])/d^2
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
```

```
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
```

```
b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^2}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{d^2x(1-c^2x^2)} + (3c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x(1-c^2x^2)^{3/2}}\,dx}{d^2}$$

$$= \frac{2bc(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} + \frac{(2bc)\int \frac{a\cdots}{x\sqrt{\cdots}}}{\cdots}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{2b^2c\tanh\cdots}{d^2}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{3ic(a+b\cdots}{\cdots}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{3ic(a+b\cdots}{\cdots}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{3ic(a+b\cdots}{\cdots}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)} - \frac{3ic(a+b\cdots}{\cdots}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1059 vs. 2(324) = 648.
time = 8.43, size = 1059, normalized size = 3.27

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -(a^2/(d^2*x)) - (a^2*c^2*x)/(2*d^2*(-1 + c^2*x^2)) - (3*a^2*c*Log[1 - c*x]
)/(4*d^2) + (3*a^2*c*Log[1 + c*x])/(4*d^2) + (a*b*c*(-2*ArcSin[c*x]*Cot[Arc
Sin[c*x]/2] + 6*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 6*ArcSin[c*x]*Lo
```

```
g[1 + I*E^(I*ArcSin[c*x])] - 4*Log[Cos[ArcSin[c*x]/2]] + 4*Log[Sin[ArcSin[c
*x]/2]] + (6*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (6*I)*PolyLog[2, I*E^(
I*ArcSin[c*x])] + ArcSin[c*x]/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2 -
 (2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin[
c*x]/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (2*Sin[ArcSin[c*x]/2])/(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*ArcSin[c*x]*Tan[ArcSin[c*x]/2]
))/(2*d^2) + (b^2*c*(-4*ArcSin[c*x] - 2*ArcSin[c*x]^2*Cot[ArcSin[c*x]/2] +
8*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]^2*Log[1 - I*E^(I*A
rcSin[c*x])] + 6*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/
(2*E^((I/2)*ArcSin[c*x]))] - 6*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] -
 6*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin
[c*x])] + 6*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/E
^((I/2)*ArcSin[c*x])] - 8*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + 6*ArcSin
[c*x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))
] - 6*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 4*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]] + 6*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin
[ArcSin[c*x]/2]] + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 6*ArcSi
n[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 6*Pi*ArcSin[c*x]*Lo
g[Sin[(Pi + 2*ArcSin[c*x])/4]] + (8*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (12
*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (12*I)*ArcSin[c*x]*Pol
yLog[2, I*E^(I*ArcSin[c*x])] - (8*I)*PolyLog[2, E^(I*ArcSin[c*x])] - 12*Pol
yLog[3, (-I)*E^(I*ArcSin[c*x])] + 12*PolyLog[3, I*E^(I*ArcSin[c*x])] + ArcS
in[c*x]^2/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2 - (4*ArcSin[c*x]*Sin[
ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin[c*x]^2/(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (4*ArcSin[c*x]*Sin[ArcSin[c*x]
/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*ArcSin[c*x]^2*Tan[ArcSin
[c*x]/2]))/(4*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 762 vs. $2(375) = 750$.
time = 0.32, size = 763, normalized size = 2.35

method	result
derivativedivides	$c\left(-\frac{a^2}{4d^2(cx-1)}+\frac{3a^2\ln(cx+1)}{4d^2}-\frac{3a^2\ln(cx-1)}{4d^2}-\frac{a^2}{4d^2(cx+1)}+\frac{3iab\,\mathrm{dilog}\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d^2}-\right.$
default	$c\left(-\frac{a^2}{4d^2(cx-1)}+\frac{3a^2\ln(cx+1)}{4d^2}-\frac{3a^2\ln(cx-1)}{4d^2}-\frac{a^2}{4d^2(cx+1)}+\frac{3iab\,\mathrm{dilog}\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d^2}-\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-1/4*a^2/d^2/(c*x-1)+3/2*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2)))-3/2*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*
```

```
b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+3/4*a^2/d^2*ln(c*x+1)-3/4*a^2/d^2*
ln(c*x-1)-1/4*a^2/d^2/(c*x+1)+3*b^2/d^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/
2)))-3*b^2/d^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b^2/d^2/(c^2*x^2-1)
/c/x*arcsin(c*x)^2+2*a*b/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-2*a*b/d^2*ln(1+
I*c*x+(-c^2*x^2+1)^(1/2))-2*b^2/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/
2))+2*I*b^2/d^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2/d^2*dilog(1+I*c*x+(
-c^2*x^2+1)^(1/2))-a^2/d^2/c/x-3/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c*x-3*
I*b^2/d^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*I*b^2/d^2*a
rcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*I*a*b/d^2*dilog(1-I*(
I*c*x+(-c^2*x^2+1)^(1/2)))+3*I*a*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))
)-3*a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+2*a*b/d^2/(c^2*x^2-1)/c/x*arcsin(c*
x)+a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-3*a*b/d^2*arcsin(c*x)*ln(1+I*(I*c
*x+(-c^2*x^2+1)^(1/2)))+3*a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))+b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*(3*c^2*x^2 - 2)/(c^2*d^2*x^3 - d^2*x) - 3*c*log(c*x + 1)/d^2 +
3*c*log(c*x - 1)/d^2) + 1/4*(3*(b^2*c^3*x^3 - b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*(b^2*c^3*x^3 - b^2*c*x)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(3*b^2*c^2*x^2 - 2*b^
2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^2*d^2*x^3 - d^2*x)*i
ntegrate(1/2*(4*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (3*(b^2*c^
4*x^4 - b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1
) - 3*(b^2*c^4*x^4 - b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 2*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^6 - 2*c^2*d^2*x^4
 + d^2*x^2), x))/(c^2*d^2*x^3 - d^2*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^6 - 2*c^2
*d^2*x^4 + d^2*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2}{c^4x^6-2c^2x^4+x^2}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^4x^6-2c^2x^4+x^2}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^4x^6-2c^2x^4+x^2}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**6 - 2*c**2*x**4 + x**2), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x^2\,{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^2), x)
```

3.199 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^3(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=270

$$-\frac{bc(a+b\text{ArcSin}(cx))}{d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\text{ArcSin}(cx))^2}{d^2\left(1-c^2x^2\right)}-\frac{(a+b\text{ArcSin}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)}-\frac{4c^2(a+b\text{ArcSin}(cx))^2\tanh^{-1}\left(e^{2i\text{ArcSi}}\right.}{d^2}$$

```
[Out] c^2*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)-1/2*(a+b*arcsin(c*x))^2/d^2/x^2/(-
c^2*x^2+1)-4*c^2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/
d^2+b^2*c^2*ln(x)/d^2-1/2*b^2*c^2*ln(-c^2*x^2+1)/d^2+2*I*b*c^2*(a+b*arcsin(
c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-2*I*b*c^2*(a+b*arcsin(c*
x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-b^2*c^2*polylog(3,-(I*c*x+(
-c^2*x^2+1)^(1/2))^2)/d^2+b^2*c^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d
^2-b*c*(a+b*arcsin(c*x))/d^2/x/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.38, antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4789, 4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266, 277, 197, 4779, 457, 78}

$$\frac{2ibc^2\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{2ibc^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}+\frac{c^2(a+b\text{ArcSin}(cx))^2}{d^2\left(1-c^2x^2\right)}-\frac{bc(a+b\text{ArcSin}(cx))}{d^2x\sqrt{1-c^2x^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)}-\frac{4c^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d^2}-\frac{b^2c^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{d^2}+\frac{b^2c^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)}{d^2}-\frac{b^2c^2\log\left(1-c^2x^2\right)}{2d^2}+\frac{b^2c^2\log(x)}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sqrt[1 - c^2*x^2])) + (c^2*(a + b*ArcSin
[c*x])^2)/(d^2*(1 - c^2*x^2)) - (a + b*ArcSin[c*x])^2/(2*d^2*x^2*(1 - c^2*x
^2)) - (4*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (
b^2*c^2*Log[x])/d^2 - (b^2*c^2*Log[1 - c^2*x^2])/(2*d^2) + ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*c^2*PolyLog[
3, -E^((2*I)*ArcSin[c*x])])/d^2 + (b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*x])
])/d^2
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
```

```
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^2}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^2x^2\left(1-c^2x^2\right)} + \left(2c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^2}\,dx + \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{x^2(1-c^2x^2)^{3/2}}\,dx}{d^2}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{c^2(a+b\sin^{-1}(cx))^2}{d^2\left(1-c^2x^2\right)} - \frac{(a+b\sin}{2d^2x^2\,(1}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\sin^{-1}(cx))^2}{d^2\left(1-c^2x^2\right)} - \frac{(a+b\sin^{-1}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)} + \frac{(2c^2)\,\mathrm{Subst}\big(\int}{}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\sin^{-1}(cx))^2}{d^2\left(1-c^2x^2\right)} - \frac{(a+b\sin^{-1}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{b^2c^2\log\left(1-\right.}{d^2}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\sin^{-1}(cx))^2}{d^2\left(1-c^2x^2\right)} - \frac{(a+b\sin^{-1}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2(a+b\sin^{-}}{}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\sin^{-1}(cx))^2}{d^2\left(1-c^2x^2\right)} - \frac{(a+b\sin^{-1}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2(a+b\sin^{-}}{}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\sin^{-1}(cx))^2}{d^2\left(1-c^2x^2\right)} - \frac{(a+b\sin^{-1}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2(a+b\sin^{-}}{}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\sin^{-1}(cx))^2}{d^2\left(1-c^2x^2\right)} - \frac{(a+b\sin^{-1}(cx))^2}{2d^2x^2\left(1-c^2x^2\right)} - \frac{4c^2(a+b\sin^{-}}{}$$

Mathematica [**A**]
time = 1.10, size = 430, normalized size = 1.59

$$\frac{-\frac{a^2}{x^2}+\frac{a^2c^2}{1-c^2x^2}+4a^2c^2\log(x)-2a^2c^2\log\left(1-c^2x^2\right)+2ab\left(-\frac{c^2x}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{1-c^2x^2}}{x}-\frac{\mathrm{ArcSin}(cx)}{x^2}+\frac{c^2\mathrm{ArcSin}(cx)}{1-c^2x^2}+2c^2\left(2\mathrm{ArcSin}(cx)\left(\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)-\log\left(1+e^{2i\mathrm{ArcSin}(cx)}\right)\right)+i\left(\mathrm{PolyLog}\left(2,-e^{2i\mathrm{ArcSin}(cx)}\right)-\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)\right)\right)+b^2c^2\left(-\frac{2cx\mathrm{ArcSin}(cx)}{\sqrt{1-c^2x^2}}-\frac{2\sqrt{1-c^2x^2}\mathrm{ArcSin}(cx)}{cx}-\frac{\mathrm{ArcSin}(cx)^2}{c^2x^2}+\frac{\mathrm{ArcSin}(cx)^2}{1-c^2x^2}+4\mathrm{ArcSin}(cx)^2\left(\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)-\log\left(1+e^{2i\mathrm{ArcSin}(cx)}\right)\right)+2\log\left(\frac{cx}{\sqrt{1-c^2x^2}}\right)+4i\mathrm{ArcSin}(cx)\left(\mathrm{PolyLog}\left(2,-e^{2i\mathrm{ArcSin}(cx)}\right)-\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)+2\left(-\mathrm{PolyLog}\left(3,-e^{2i\mathrm{ArcSin}(cx)}\right)+\mathrm{PolyLog}\left(3,e^{2i\mathrm{ArcSin}(cx)}\right)\right)\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] (-(a^2/x^2) + (a^2*c^2)/(1 - c^2*x^2) + 4*a^2*c^2*Log[x] - 2*a^2*c^2*Log[1
- c^2*x^2] + 2*a*b*(-((c^3*x)/Sqrt[1 - c^2*x^2]) - (c*Sqrt[1 - c^2*x^2])/x
- ArcSin[c*x]/x^2 + (c^2*ArcSin[c*x])/(1 - c^2*x^2) + 2*c^2*(2*ArcSin[c*x]*
(Log[1 - E^((2*I)*ArcSin[c*x])] - Log[1 + E^((2*I)*ArcSin[c*x])]) + I*(Poly
Log[2, -E^((2*I)*ArcSin[c*x])] - PolyLog[2, E^((2*I)*ArcSin[c*x])]))) + b^2
*c^2*((-2*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*Sqrt[1 - c^2*x^2]*ArcSin[
c*x])/(c*x) - ArcSin[c*x]^2/(c^2*x^2) + ArcSin[c*x]^2/(1 - c^2*x^2) + 4*Arc
Sin[c*x]^2*(Log[1 - E^((2*I)*ArcSin[c*x])] - Log[1 + E^((2*I)*ArcSin[c*x])]
) + 2*Log[(c*x)/Sqrt[1 - c^2*x^2]] + (4*I)*ArcSin[c*x]*(PolyLog[2, -E^((2*I
)*ArcSin[c*x])] - PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 2*(-PolyLog[3, -E^((
2*I)*ArcSin[c*x])] + PolyLog[3, E^((2*I)*ArcSin[c*x])])))/(2*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 844 vs. $2(312) = 624$.
time = 0.28, size = 845, normalized size = 3.13

method	result
derivativedivides	$c^2 \left(-\frac{a^2}{4d^2(cx-1)} + \frac{b^2 \arcsin(cx)^2}{2d^2(c^2x^2-1)c^2x^2} - \frac{b^2 \operatorname{polylog}\left(3, -\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d^2} - \frac{b^2 \ln\left(1+\left(icx+\sqrt{-c\right.\right.}{d^2}\right.$
default	$c^2 \left(-\frac{a^2}{4d^2(cx-1)} + \frac{b^2 \arcsin(cx)^2}{2d^2(c^2x^2-1)c^2x^2} - \frac{b^2 \operatorname{polylog}\left(3, -\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d^2} - \frac{b^2 \ln\left(1+\left(icx+\sqrt{-c\right.\right.}{d^2}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/4*a^2/d^2/(c*x-1)+1/2*b^2/d^2/(c^2*x^2-1)/c^2/x^2*arcsin(c*x)^2-a^2
/d^2*ln(c*x+1)-a^2/d^2*ln(c*x-1)+1/4*a^2/d^2/(c*x+1)-b^2/d^2*ln(1+(I*c*x+(-
c^2*x^2+1)^(1/2))^2)+2*a^2/d^2*ln(c*x)+4*b^2/d^2*polylog(3,-I*c*x-(-c^2*x^2
+1)^(1/2))+4*b^2/d^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+4*a*b/d^2*arcsin(c
*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+4*a*b/d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x
^2+1)^(1/2))-1/2*a^2/d^2/c^2/x^2-4*I*b^2/d^2*arcsin(c*x)*polylog(2,-I*c*x-(
-c^2*x^2+1)^(1/2))-4*I*b^2/d^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/
2))+2*I*b^2/d^2*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*I*a*
b/d^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4*I*a*b/d^2*polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))-4*I*a*b/d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2/
d^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2/d^2*arcsin(c*x)^2*ln
(1-I*c*x-(-c^2*x^2+1)^(1/2))+b^2/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+b^2/d^2
*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+a*b/d^2/c/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+
a*b/d^2/(c^2*x^2-1)/c^2/x^2*arcsin(c*x)+b^2/d^2/(c^2*x^2-1)/c/x*arcsin(c*x)
*(-c^2*x^2+1)^(1/2)-b^2/d^2*arcsin(c*x)^2/(c^2*x^2-1)-2*b^2/d^2*arcsin(c*x)
```

```
^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*a*b/d^2*arcsin(c*x)/(c^2*x^2-1)-4*a
*b/d^2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b^2*polylog(3,-(I*c*x
+(-c^2*x^2+1)^(1/2))^2)/d^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(2*c^2*log(c*x + 1)/d^2 + 2*c^2*log(c*x - 1)/d^2 - 4*c^2*log(x)/d^
2 + (2*c^2*x^2 - 1)/(c^2*d^2*x^4 - d^2*x^2)) + integrate((b^2*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^7 - 2*c^2
*d^2*x^5 + d^2*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2}{c^4x^7-2c^2x^5+x^3}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^4x^7-2c^2x^5+x^3}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^4x^7-2c^2x^5+x^3}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**7 - 2*c**2*x**5 + x**3), x))/d**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x^3\,\left(d-c^2\,d\,x^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^2), x)
```

3.200 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=439

$$-\frac{b^2c^2}{3d^2x}-\frac{2bc^3(a+b\text{ArcSin}(cx))}{3d^2\sqrt{1-c^2x^2}}-\frac{bc(a+b\text{ArcSin}(cx))}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{3d^2x^3\,(1-c^2x^2)}-\frac{5c^2(a+b\text{ArcSin}(cx))^2}{3d^2x\,(1-c^2x^2)}+\frac{5c^4x(a}{2c}$$

```
[Out] -1/3*b^2*c^2/d^2/x-1/3*(a+b*arcsin(c*x))^2/d^2/x^3/(-c^2*x^2+1)-5/3*c^2*(a+
b*arcsin(c*x))^2/d^2/x/(-c^2*x^2+1)+5/2*c^4*x*(a+b*arcsin(c*x))^2/d^2/(-c^2
*x^2+1)-5*I*c^3*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-26
/3*b*c^3*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^2+b^2*c^3*ar
ctanh(c*x)/d^2+13/3*I*b^2*c^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d^2+5*I*
b*c^3*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-5*I*b*
c^3*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-13/3*I*b^
2*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))/d^2-5*b^2*c^3*polylog(3,-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/d^2+5*b^2*c^3*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/d^2-2/3*b*c^3*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)^(1/2)-1/3*b*c*(a+b*arcsin
(c*x))/d^2/x^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.65, antiderivative size = 439, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 4793, 4803, 4268, 2317, 2438, 331}

$$-\frac{5ic^3\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d^2}+\frac{5ibc^3\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{5ibc^3\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{26bc^3\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d^2}-\frac{5c^2(a+b\text{ArcSin}(cx))^2}{3d^2x\,(1-c^2x^2)}-\frac{bc(a+b\text{ArcSin}(cx))}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{3d^2x^3\,(1-c^2x^2)}+\frac{5c^4x(a+b\text{ArcSin}(cx))^2}{2d^2\,(1-c^2x^2)}-\frac{2bc^3(a+b\text{ArcSin}(cx))}{3d^2\sqrt{1-c^2x^2}}+\frac{13ib^2c^3\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{3d^2}-\frac{13ib^2c^3\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{3d^2}-\frac{5b^2c^3\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{d^2}+\frac{5b^2c^3\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{d^2}+\frac{b^2c^3\tanh^{-1}(cx)}{d^2}-\frac{b^2c^2}{3d^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/3*(b^2*c^2)/(d^2*x) - (2*b*c^3*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1 - c^2*
x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]) - (a + b*Ar
cSin[c*x])^2/(3*d^2*x^3*(1 - c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x])^2)/(3*d
^2*x*(1 - c^2*x^2)) + (5*c^4*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2))
 - ((5*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (26*b*
c^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^2) + (b^2*c^3*ArcT
anh[c*x])/d^2 + (((13*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + (
(5*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - (
(5*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - (((1
3*I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^2 - (5*b^2*c^3*PolyLog[3,
(-I)*E^(I*ArcSin[c*x])])/d^2 + (5*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])])/
d^2
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
```

```
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^4(d-c^2dx^2)^2}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} + \frac{1}{3}(5c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^2}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x^3(1-c^2x^2)^{3/2}}\,dx}{3d^2}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\sin^{-1}(cx))^2}{3d^2x(1-c^2x^2)} + (5c^4)\int \frac{(a \cdots}{(\cdots}$$

$$= -\frac{b^2c^2}{3d^2x} + \frac{13bc^3(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2\cdots}{\cdots}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(\cdots}{3\cdots}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(\cdots}{3\cdots}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(\cdots}{3\cdots}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(\cdots}{3\cdots}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(\cdots}{3\cdots}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1390 vs. $2(439) = 878$.
time $= 10.82$, size $= 1390$, normalized size $= 3.17$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/3*a^2/(d^2*x^3) - (2*a^2*c^2)/(d^2*x) - (a^2*c^4*x)/(2*d^2*(-1 + c^2*x^2
)) - (5*a^2*c^3*Log[1 - c*x])/(4*d^2) + (5*a^2*c^3*Log[1 + c*x])/(4*d^2) +
(2*a*b*((c^3*(Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(4*(-1 + c*x)) - (c^4*(Sqrt
[1 - c^2*x^2] + ArcSin[c*x]))/(4*(c + c^2*x)) + 2*c^2*(-(ArcSin[c*x]/x) - c
*ArcTanh[Sqrt[1 - c^2*x^2]]) - (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3
*x^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*x^3) - (5*c^4*((((3*I)/2)*Pi*ArcSin[c*x
])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (
Pi*Log[1 + I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c
*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c
```

```
*x])/4]])/c - ((2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]])/c))/4 + (5*c^4*(((
I/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*Ar
cSin[c*x])]])/c + (Pi*Log[1 - I*E^(I*ArcSin[c*x])]])/c + (2*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])]])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin
[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]])/c))/
4))/d^2 + (b^2*c^3*(-24*ArcSin[c*x] - (6*ArcSin[c*x]^2)/(-1 + c*x) - 4*Cot[
ArcSin[c*x]/2] - 26*ArcSin[c*x]^2*Cot[ArcSin[c*x]/2] - 2*ArcSin[c*x]*Csc[Ar
cSin[c*x]/2]^2 - (c*x*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^4)/2 + 104*ArcSin[c*
x]*Log[1 - E^(I*ArcSin[c*x])] + 60*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x]
)] + 60*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I/
2)*ArcSin[c*x]))] - 60*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] - 60*ArcS
in[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])]
 + 60*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/E^((I/2
)*ArcSin[c*x])] - 104*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + 60*ArcSin[c*
x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] -
 60*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 24*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]] + 60*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin
[ArcSin[c*x]/2]] + 24*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 60*Arc
Sin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 60*Pi*ArcSin[c*x]
*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (104*I)*PolyLog[2, -E^(I*ArcSin[c*x])]
+ (120*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (120*I)*ArcSin[c
*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - (104*I)*PolyLog[2, E^(I*ArcSin[c*x])]
 - 120*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 120*PolyLog[3, I*E^(I*ArcSin[c*
x])] + 2*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - (24*ArcSin[c*x]*Sin[ArcSin[c*x]
/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (8*ArcSin[c*x]^2*Sin[ArcSi
n[c*x]/2]^4)/(c^3*x^3) - (6*ArcSin[c*x]^2)/(Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2])^2 + (24*ArcSin[c*x]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2]) - 4*Tan[ArcSin[c*x]/2] - 26*ArcSin[c*x]^2*Tan[ArcSin[c*x]/
2]))/(24*d^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 963 vs. $2(472) = 944$.
time = 0.40, size = 964, normalized size = 2.20 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-1/4*a^2/d^2/(c*x-1)+5/2*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))-5/2*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*
I*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+5/4*a^2/d^2*ln(c*x+1)-5/4*a^2/d^
2*ln(c*x-1)-1/4*a^2/d^2/(c*x+1)+5*b^2/d^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(
1/2)))-5*b^2/d^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/3*b^2/d^2*c*x/(
c^2*x^2-1)+1/3*b^2/d^2/c/x/(c^2*x^2-1)+5*I*a*b/d^2*dilog(1+I*(I*c*x+(-c^2*x
^2+1)^(1/2)))-5*I*a*b/d^2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5*I*b^2/d^2
*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5*I*b^2/d^2*arcsin(c*x
)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/3*b^2/d^2/(c^2*x^2-1)/c/x*arcs
```

```
in(c*x)^2+13/3*a*b/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-13/3*a*b/d^2*ln(1+I*c
*x+(-c^2*x^2+1)^(1/2))-13/3*b^2/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/
2))-2*a^2/d^2/c/x-5/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c*x+13/3*I*b^2/d^2*
dilog(I*c*x+(-c^2*x^2+1)^(1/2))+13/3*I*b^2/d^2*dilog(1+I*c*x+(-c^2*x^2+1)^(
1/2))-1/3*a^2/d^2/c^3/x^3+1/3*b^2/d^2/c^2/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)+1/3*a*b/d^2/c^2/x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+2/3*a*b/d^
2/c^3/x^3/(c^2*x^2-1)*arcsin(c*x)+1/3*b^2/d^2/c^3/x^3/(c^2*x^2-1)*arcsin(c*
x)^2-5*a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+10/3*a*b/d^2/(c^2*x^2-1)/c/x*arc
sin(c*x)+2/3*a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-5*a*b/d^2*arcsin(c*x)*l
n(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5*a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2
*x^2+1)^(1/2)))+2/3*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/12*(15*c^3*log(c*x + 1)/d^2 - 15*c^3*log(c*x - 1)/d^2 - 2*(15*c^4*x^4 - 1
0*c^2*x^2 - 2)/(c^2*d^2*x^5 - d^2*x^3))*a^2 + 1/12*(15*(b^2*c^5*x^5 - b^2*c
^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 15*(b^2
*c^5*x^5 - b^2*c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c
*x + 1) - 2*(15*b^2*c^4*x^4 - 10*b^2*c^2*x^2 - 2*b^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))^2 + 12*(c^2*d^2*x^5 - d^2*x^3)*integrate(1/6*(12*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (15*(b^2*c^6*x^6 - b^2*c^4*x^4
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(b^2*c^6*x^6
 - b^2*c^4*x^4)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) -
2*(15*b^2*c^5*x^5 - 10*b^2*c^3*x^3 - 2*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^8 - 2*c^2*d^2*x^6
 + d^2*x^4), x))/(c^2*d^2*x^5 - d^2*x^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^8 - 2*c^2
*d^2*x^6 + d^2*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2}{c^4x^8-2c^2x^6+x^4}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^4x^8-2c^2x^6+x^4}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^4x^8-2c^2x^6+x^4}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**8 - 2*c**2*x**6 + x**4), x))/d**2
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x^4\,{\left(d-c^2\,d\,x^2\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^2), x)
```

3.201 $\int \frac{x^4(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=343

$$\frac{b^2x}{12c^4d^3\left(1-c^2x^2\right)}-\frac{b(a+b\text{ArcSin}(cx))}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{5b(a+b\text{ArcSin}(cx))}{4c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3(a+b\text{ArcSin}(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x(a+b\text{ArcSin}(cx))^2}{8c^4d^3\left(1-c^2x^2\right)}$$

```
[Out] 1/12*b^2*x/c^4/d^3/(-c^2*x^2+1)-1/6*b*(a+b*arcsin(c*x))/c^5/d^3/(-c^2*x^2+1
)^(3/2)+1/4*x^3*(a+b*arcsin(c*x))^2/c^2/d^3/(-c^2*x^2+1)^2-3/8*x*(a+b*arcsi
n(c*x))^2/c^4/d^3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2
*x^2+1)^(1/2))/c^5/d^3-7/6*b^2*arctanh(c*x)/c^5/d^3+3/4*I*b*(a+b*arcsin(c*x
))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3-3/4*I*b*(a+b*arcsin(c*x
))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3-3/4*b^2*polylog(3,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3+3/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1
/2)))/c^5/d^3+5/4*b*(a+b*arcsin(c*x))/c^5/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.38, antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.482$, Rules used = {4791, 4749, 4266, 2611, 2320, 6724, 4767, 212, 272, 45, 4779, 12, 393}

$$-\frac{3i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{4c^5d^3}+\frac{3ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4c^5d^3}-\frac{3ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4c^5d^3}+\frac{x^3(a+b\text{ArcSin}(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2}+\frac{5b(a+b\text{ArcSin}(cx))}{4c^5d^3\sqrt{1-c^2x^2}}-\frac{b(a+b\text{ArcSin}(cx))}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}-\frac{3x(a+b\text{ArcSin}(cx))^2}{8c^4d^3\left(1-c^2x^2\right)}-\frac{3b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{4c^5d^3}+\frac{3b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{4c^5d^3}-\frac{7b^2\tanh^{-1}(cx)}{6c^5d^3}+\frac{b^2x}{12c^4d^3\left(1-c^2x^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (b^2*x)/(12*c^4*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^5*d^3*(1
- c^2*x^2)^(3/2)) + (5*b*(a + b*ArcSin[c*x]))/(4*c^5*d^3*Sqrt[1 - c^2*x^2])
 + (x^3*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*Ar
cSin[c*x])^2)/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*
ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^3) - (7*b^2*ArcTanh[c*x])/(6*c^5*d^3) + (
((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^
3) - (((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5
*d^3) - (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^5*d^3) + (3*b^2*Pol
yLog[3, I*E^(I*ArcSin[c*x])])/(4*c^5*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 393

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(-(b*c - a*d))*x*((a + b*x^n)^(p + 1)/(a*b*n*(p + 1))), x] - Dist[(a*d -
 b*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; F
reeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n
 + p, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{x^3(a+b\sin^{-1}(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{b\int \frac{x^3(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}dx}{2cd^3} - \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}dx}{4c^2d}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\sin^{-1}(cx))}{2c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-1}(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\sin}{8c^4d^3(}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\sin^{-1}(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-1}(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b}{8c^4d^3}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\sin^{-1}(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-}}{4c^2d^3(1-}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\sin^{-1}(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-}}{4c^2d^3(1-}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\sin^{-1}(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-}}{4c^2d^3(1-}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\sin^{-1}(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\sin^{-}}{4c^2d^3(1-}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1012 vs. $2(343) = 686$.
time = 5.97, size = 1012, normalized size = 2.95

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((24*a^2*c*x)/(-1 + c^2*x^2)^2 + (60*a^2*c*x)/(-1 + c^2*x^2) - (60*a*b*(Sqr
t[1 - c^2*x^2] - ArcSin[c*x]))/(-1 + c*x) + (60*a*b*(Sqrt[1 - c^2*x^2] + Ar
cSin[c*x]))/(1 + c*x) + (4*a*b*((-2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x
]))/(-1 + c*x)^2 - (4*a*b*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(1
 + c*x)^2 - 18*a^2*Log[1 - c*x] + 18*a^2*Log[1 + c*x] + 18*a*b*(I*ArcSin[c*
x]^2 + ArcSin[c*x]*((-3*I)*Pi - 4*Log[1 + I*E^(I*ArcSin[c*x])]) + 2*Pi*(-2*
Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 + I*E^(I*ArcSin[c*x])] + 2*Log[Cos[Ar
cSin[c*x]/2]] - Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])]) + 18*a*b*((-I)*ArcSin[c*x]^2 + ArcSin[c*x]*(I*Pi + 4*Lo
g[1 - I*E^(I*ArcSin[c*x])]) + 2*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1
 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSi
```

```
n[c*x])/4]]) - (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]) + 4*b^2*(9*ArcSin[c*x
]^2*Log[1 - I*E^(I*ArcSin[c*x])] + 9*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*
E^(I*ArcSin[c*x])))/(2*E^((I/2)*ArcSin[c*x]))] - 9*ArcSin[c*x]^2*Log[1 + I*
E^(I*ArcSin[c*x])] - 9*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x
])))/E^((I/2)*ArcSin[c*x])] + 9*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E
^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] + 9*ArcSin[c*x]^2*Log[((1 + I) +
(1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] - 9*Pi*ArcSin[c*x]*Lo
g[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] + 9*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 28*
Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 9*ArcSin[c*x]^2*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]] - 9*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*ArcSin[
c*x])/4]] + (18*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (18*I)*
ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 18*PolyLog[3, (-I)*E^(I*ArcSi
n[c*x])] + 18*PolyLog[3, I*E^(I*ArcSin[c*x])]) + (b^2*(ArcSin[c*x]*(74*Sqrt
[1 - c^2*x^2] + 30*Cos[3*ArcSin[c*x]]) + 3*ArcSin[c*x]^2*(3*c*x - 5*Sin[3*A
rcSin[c*x]]) + 2*(c*x + Sin[3*ArcSin[c*x]]))))/(-1 + c^2*x^2)^2)/(96*c^5*d^3
)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 843 vs. $2(350) = 700$.
time = 0.62, size = 844, normalized size = 2.46

method	result
derivativedivides	$\frac{\frac{5b^2\arcsin(cx)^2c^3x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}+\frac{3b^2\,\mathrm{polylog}\left(3,i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}-\frac{3b^2\,\mathrm{polylog}\left(3,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}+\frac{3a^2\ln(cx+1}{16d^3}}{}$
default	$\frac{\frac{5b^2\arcsin(cx)^2c^3x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}+\frac{3b^2\,\mathrm{polylog}\left(3,i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}-\frac{3b^2\,\mathrm{polylog}\left(3,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}+\frac{3a^2\ln(cx+1}{16d^3}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(5/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^3*x^3+3/16*a^2/d^3
*ln(c*x+1)-3/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c*x-5/4*b^2/d^3/
(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2+5/4*a*b/d^3/(c
^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^3*x^3-5/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c
^2*x^2*(-c^2*x^2+1)^(1/2)-3/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c*x
+13/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-3/4*I*b
^2/d^3*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I*b^2/d^3*ar
csin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+13/12*a*b/d^3/(c^4*x^4-2
*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-3/4*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*
x^2+1)^(1/2)))+3/4*a*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3
/4*I*a*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/4*I*a*b/d^3*dilog(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3+1/12
```

```
*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c*x-3/16*a^2/d^3*ln(c*x-1)-1/16*a^2/d^3/(c*x
+1)^2+5/16*a^2/d^3/(c*x+1)+1/16*a^2/d^3/(c*x-1)^2+5/16*a^2/d^3/(c*x-1)+3/4*
b^2/d^3*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/4*b^2/d^3*polylog(3,-I*(I
*c*x+(-c^2*x^2+1)^(1/2)))+3/8*b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))-3/8*b^2/d^3*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7/
3*I*b^2/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a^2*(2*(5*c^2*x^3 - 3*x)/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 3*l
og(c*x + 1)/(c^5*d^3) - 3*log(c*x - 1)/(c^5*d^3)) + 1/16*(3*(b^2*c^4*x^4 -
2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x +
 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2*log(-c*x + 1) + 2*(5*b^2*c^3*x^3 - 3*b^2*c*x)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))^2 + 16*(c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)*
integrate(-1/8*(16*a*b*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) -
 (3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))*log(c*x + 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*(5*b^2*c^3*x^3 - 3*b^2*c*x)*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(
c^10*d^3*x^6 - 3*c^8*d^3*x^4 + 3*c^6*d^3*x^2 - c^4*d^3), x))/(c^9*d^3*x^4 -
 2*c^7*d^3*x^2 + c^5*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^6*d^
3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x^4}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{b^2x^4\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{2abx^4\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**4/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**4*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**4*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.202 $\int \frac{x^3(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=172

$$\frac{b^2}{12c^4d^3(1-c^2x^2)}-\frac{bx^3(a+b\text{ArcSin}(cx))}{6cd^3(1-c^2x^2)^{3/2}}+\frac{bx(a+b\text{ArcSin}(cx))}{2c^3d^3\sqrt{1-c^2x^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{4c^4d^3}+\frac{x^4(a+b\text{ArcSin}(cx)}{4d^3(1-c^2x^2)^2}$$

```
[Out] 1/12*b^2/c^4/d^3/(-c^2*x^2+1)-1/6*b*x^3*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1
)^(3/2)-1/4*(a+b*arcsin(c*x))^2/c^4/d^3+1/4*x^4*(a+b*arcsin(c*x))^2/d^3/(-c
^2*x^2+1)^2+1/3*b^2*ln(-c^2*x^2+1)/c^4/d^3+1/2*b*x*(a+b*arcsin(c*x))/c^3/d^
3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.24, antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4771, 4791, 4737, 266, 272, 45}

$$-\frac{(a+b\text{ArcSin}(cx))^2}{4c^4d^3}+\frac{x^4(a+b\text{ArcSin}(cx))^2}{4d^3(1-c^2x^2)^2}-\frac{bx^3(a+b\text{ArcSin}(cx))}{6cd^3(1-c^2x^2)^{3/2}}+\frac{bx(a+b\text{ArcSin}(cx))}{2c^3d^3\sqrt{1-c^2x^2}}+\frac{b^2}{12c^4d^3(1-c^2x^2)}+\frac{b^2\log(1-c^2x^2)}{3c^4d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] b^2/(12*c^4*d^3*(1 - c^2*x^2)) - (b*x^3*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 -
c^2*x^2)^(3/2)) + (b*x*(a + b*ArcSin[c*x]))/(2*c^3*d^3*Sqrt[1 - c^2*x^2]) -
 (a + b*ArcSin[c*x])^2/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x])^2)/(4*d^3*(1
- c^2*x^2)^2) + (b^2*Log[1 - c^2*x^2])/(3*c^4*d^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{x^4(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x^4(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{2d^3}$$

$$= -\frac{bx^3(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{x^4(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{b^2\int \frac{x^3}{(1-c^2x^2)^2}\,dx}{6d^3} + \frac{b\int \frac{x^2(a+b\sin}{(1-c^2x}}{2cd}$$

$$= -\frac{bx^3(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{bx(a+b\sin^{-1}(cx))}{2c^3d^3\sqrt{1-c^2x^2}} + \frac{x^4(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{b^2\text{Subst}}{}$$

$$= -\frac{bx^3(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{bx(a+b\sin^{-1}(cx))}{2c^3d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx))^2}{4c^4d^3} + \frac{x^4(a+b\sin}{4d^3(1-}$$

$$= \frac{b^2}{12c^4d^3(1-c^2x^2)} - \frac{bx^3(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{bx(a+b\sin^{-1}(cx))}{2c^3d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(}{4c^4d^3}$$

Mathematica [A]
time = 0.13, size = 192, normalized size = 1.12

$$\frac{-3a^2+b^2+6a^2c^2x^2-b^2c^2x^2+6abcx\sqrt{1-c^2x^2}-8abc^3x^3\sqrt{1-c^2x^2}+2b\left(bcx(3-4c^2x^2)\sqrt{1-c^2x^2}+a(-3+6c^2x^2)\right)\text{ArcSin}(cx)+3b^2(-1+2c^2x^2)\text{ArcSin}(cx)^2+4b^2(-1+c^2x^2)^2\log(1-c^2x^2)}{12c^4d^3(-1+c^2x^2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (-3*a^2 + b^2 + 6*a^2*c^2*x^2 - b^2*c^2*x^2 + 6*a*b*c*x*Sqrt[1 - c^2*x^2] -
 8*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*(b*c*x*(3 - 4*c^2*x^2)*Sqrt[1 - c^2*
x^2] + a*(-3 + 6*c^2*x^2))*ArcSin[c*x] + 3*b^2*(-1 + 2*c^2*x^2)*ArcSin[c*x]
^2 + 4*b^2*(-1 + c^2*x^2)^2*Log[1 - c^2*x^2])/(12*c^4*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 376 vs. $2(156) = 312$.
time = 0.49, size = 377, normalized size = 2.19

method	result
derivativedivides	$\frac{-\frac{a^2\left(-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}\right)}{d^3}+\frac{b^2\arcsin(cx)^2}{4d^3\left(c^2x^2-1\right)^2}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{6d^3\left(c^2x^2-1\right)^2}-\frac{b^2}{12d^3\left(c^2x^2-1\right)}}{}$
default	$\frac{-\frac{a^2\left(-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}\right)}{d^3}+\frac{b^2\arcsin(cx)^2}{4d^3\left(c^2x^2-1\right)^2}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{6d^3\left(c^2x^2-1\right)^2}-\frac{b^2}{12d^3\left(c^2x^2-1\right)}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-a^2/d^3*(-1/16/(c*x+1)^2+3/16/(c*x+1)-1/16/(c*x-1)^2-3/16/(c*x-1))+
1/4*b^2/d^3*arcsin(c*x)^2/(c^2*x^2-1)^2-1/6*b^2/d^3*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)/(c^2*x^2-1)^2*c*x-1/12*b^2/d^3/(c^2*x^2-1)-2/3*b^2/d^3*(-c^2*x^2+1)
^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c*x+1/3*b^2*ln(-c^2*x^2+1)/d^3+1/2*b^2/d^3*a
rcsin(c*x)^2/(c^2*x^2-1)-2*a*b/d^3*(-1/16*arcsin(c*x)/(c*x+1)^2+3/16*arcsin
(c*x)/(c*x+1)-1/16*arcsin(c*x)/(c*x-1)^2-3/16*arcsin(c*x)/(c*x-1)+1/48/(c*x
-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/6/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/6
/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/
2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(2*c^2*x^2 - 1)*a^2/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 1/4*((2*b
^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^8*d^3
*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)*integrate(-1/2*(4*a*b*c^3*x^3*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1)) - (2*b^2*c^2*x^2 - b^2)*sqrt(c*x + 1)*sqrt(-c
*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^9*d^3*x^6 - 3*c^7*d^
3*x^4 + 3*c^5*d^3*x^2 - c^3*d^3), x))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^
3)
```

Fricas [A]
time = 3.32, size = 198, normalized size = 1.15

$$\frac{(6\,a^2-b^2)c^2x^2+3\,(2\,b^2c^2x^2-b^2)\arcsin(cx)^2-3\,a^2+b^2+6\,(2\,abc^2x^2-ab)\arcsin(cx)+4\,(b^2c^4x^4-2\,b^2c^2x^2+b^2)\log(c^2x^2-1)-2\,(4\,abc^3x^3-3\,abcx+(4\,b^2c^3x^3-3\,b^2cx)\arcsin(cx))\sqrt{-c^2x^2+1}}{12\,(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/12*((6*a^2 - b^2)*c^2*x^2 + 3*(2*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - 3*a^2
 + b^2 + 6*(2*a*b*c^2*x^2 - a*b)*arcsin(c*x) + 4*(b^2*c^4*x^4 - 2*b^2*c^2*x
^2 + b^2)*log(c^2*x^2 - 1) - 2*(4*a*b*c^3*x^3 - 3*a*b*c*x + (4*b^2*c^3*x^3
- 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2
+ c^4*d^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int\frac{a^2x^3}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{b^2x^3\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int\frac{2abx^3\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**3/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**3*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**3*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 318 vs. 2(154) = 308.
time = 0.50, size = 318, normalized size = 1.85

$$\frac{b^2x^4\arcsin(cx)^2}{4\,(c^2x^2-1)^2d^3}+\frac{abx^4\arcsin(cx)}{2\,(c^2x^2-1)^2d^3}+\frac{a^2x^4}{4\,(c^2x^2-1)^2d^3}+\frac{b^2x^3\arcsin(cx)}{6\,(c^2x^2-1)\sqrt{-c^2x^2+1}\,cd^3}+\frac{abx^3}{6\,(c^2x^2-1)\sqrt{-c^2x^2+1}\,cd^3}-\frac{b^2x^2}{12\,(c^2x^2-1)c^2d^3}+\frac{b^2x\arcsin(cx)}{2\,\sqrt{-c^2x^2+1}\,c^3d^3}-\frac{b^2\arcsin(cx)^2}{4\,c^4d^3}+\frac{abx}{2\,\sqrt{-c^2x^2+1}\,c^3d^3}-\frac{ab\arcsin(cx)}{2\,c^4d^3}+\frac{2\,b^2\log(2)}{3\,c^4d^3}+\frac{b^2\log(|-c^2x^2+1|)}{3\,c^4d^3}-\frac{a^2}{4\,c^4d^3}+\frac{b^2}{12\,c^4d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b^2*x^4*arcsin(c*x)^2/((c^2*x^2 - 1)^2*d^3) + 1/2*a*b*x^4*arcsin(c*x)/(
(c^2*x^2 - 1)^2*d^3) + 1/4*a^2*x^4/((c^2*x^2 - 1)^2*d^3) + 1/6*b^2*x^3*arcs
in(c*x)/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*c*d^3) + 1/6*a*b*x^3/((c^2*x^2 -
1)*sqrt(-c^2*x^2 + 1)*c*d^3) - 1/12*b^2*x^2/((c^2*x^2 - 1)*c^2*d^3) + 1/2*b
^2*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1)*c^3*d^3) - 1/4*b^2*arcsin(c*x)^2/(c^4*
d^3) + 1/2*a*b*x/(sqrt(-c^2*x^2 + 1)*c^3*d^3) - 1/2*a*b*arcsin(c*x)/(c^4*d^
3) + 2/3*b^2*log(2)/(c^4*d^3) + 1/3*b^2*log(abs(-c^2*x^2 + 1))/(c^4*d^3) -
1/4*a^2/(c^4*d^3) + 1/12*b^2/(c^4*d^3)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.203 $\int \frac{x^2(a+b\textbf{ArcSin}(cx))^2}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal. Leaf size=341

$$\frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)}-\frac{b(a+b\text{ArcSin}(cx))}{6c^3d^3\left(1-c^2x^2\right)^{3/2}}+\frac{b(a+b\text{ArcSin}(cx))}{4c^3d^3\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{x(a+b\text{ArcSin}(cx))^2}{8c^2d^3\left(1-c^2x^2\right)}+$$

```
[Out] 1/12*b^2*x/c^2/d^3/(-c^2*x^2+1)-1/6*b*(a+b*arcsin(c*x))/c^3/d^3/(-c^2*x^2+1
)^(3/2)+1/4*x*(a+b*arcsin(c*x))^2/c^2/d^3/(-c^2*x^2+1)^2-1/8*x*(a+b*arcsin(
c*x))^2/c^2/d^3/(-c^2*x^2+1)+1/4*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x
^2+1)^(1/2))/c^3/d^3-1/6*b^2*arctanh(c*x)/c^3/d^3-1/4*I*b*(a+b*arcsin(c*x))
*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^3+1/4*I*b*(a+b*arcsin(c*x))
*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^3+1/4*b^2*polylog(3,-I*(I*c*
x+(-c^2*x^2+1)^(1/2)))/c^3/d^3-1/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2
)))/c^3/d^3+1/4*b*(a+b*arcsin(c*x))/c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 341, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.370$, Rules used = {4791, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205}

$$\frac{i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{4c^3d^3}-\frac{ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4c^3d^3}+\frac{ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4c^3d^3}-\frac{x(a+b\text{ArcSin}(cx))^2}{8c^2d^3\left(1-c^2x^2\right)}+\frac{x(a+b\text{ArcSin}(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2}+\frac{b(a+b\text{ArcSin}(cx))}{4c^3d^3\sqrt{1-c^2x^2}}-\frac{b(a+b\text{ArcSin}(cx))}{6c^3d^3\left(1-c^2x^2\right)^{3/2}}+\frac{b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{4c^3d^3}-\frac{b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{4c^3d^3}-\frac{b^2\tanh^{-1}(cx)}{6c^3d^3}+\frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (b^2*x)/(12*c^2*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^3*d^3*(1
- c^2*x^2)^(3/2)) + (b*(a + b*ArcSin[c*x]))/(4*c^3*d^3*Sqrt[1 - c^2*x^2]) +
 (x*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c
*x])^2)/(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(
I*ArcSin[c*x])])/(c^3*d^3) - (b^2*ArcTanh[c*x])/(6*c^3*d^3) - ((I/4)*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3) + ((I/4)*b*(a
 + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3) + (b^2*PolyLog
[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^3*d^3) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*
x])])/(4*c^3*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}dx = \frac{x(a+b\sin^{-1}(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{b\int \frac{x(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}dx}{2cd^3} - \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}dx}{4c^2d}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{x(a+b\sin^{-1}(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\sin^{-1}(cx))^2}{8c^2d^3(1-c^2x^2)} + \frac{b^2\int \frac{1}{(1-c^2}}{6c^2d}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\sin^{-1}(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(}{4c^2d^3(1-c^2}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\sin^{-1}(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(}{4c^2d^3(1-c^2}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\sin^{-1}(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(}{4c^2d^3(1-c^2}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\sin^{-1}(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(}{4c^2d^3(1-c^2}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\sin^{-1}(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(}{4c^2d^3(1-c^2}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 791 vs. $2(341) = 682$.
time = 4.67, size = 791, normalized size = 2.32

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((12*a^2*c*x)/(-1 + c^2*x^2)^2 + (6*a^2*c*x)/(-1 + c^2*x^2) + (a*b*(-3 + Sq
rt[1 - c^2*x^2] - 4*Cos[2*ArcSin[c*x]] + 3*Cos[3*ArcSin[c*x]] - Cos[4*ArcSi
n[c*x]] + 12*ArcSin[c*x]*(c*x + c^3*x^3 - (-1 + c^2*x^2)^2*Log[1 - I*E^(I*A
rcSin[c*x])] + (-1 + c^2*x^2)^2*Log[1 + I*E^(I*ArcSin[c*x])])))/(-1 + c^2*x
^2)^2 + 3*a^2*Log[1 - c*x] - 3*a^2*Log[1 + c*x] - (12*I)*a*b*PolyLog[2, (-I
)*E^(I*ArcSin[c*x])] + (12*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*b^2*(
3*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] + 3*Pi*ArcSin[c*x]*Log[((-1)^(
1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I/2)*ArcSin[c*x]))] - 3*ArcSin[c*x]^
2*Log[1 + I*E^(I*ArcSin[c*x])] - 3*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(
I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] + 3*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(
1/4)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] + 3*ArcSin[c*x]^2*Log
```

```
[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] - 3*Pi*Ar
cSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 4*Log[Cos[ArcSin[c*x]/2] - Si
n[ArcSin[c*x]/2]] + 3*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2]] + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 3*ArcSin[c*x]^2*Lo
g[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 3*Pi*ArcSin[c*x]*Log[Sin[(Pi +
 2*ArcSin[c*x])/4]] + (6*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]
- (6*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 6*PolyLog[3, (-I)*E^(
I*ArcSin[c*x])] + 6*PolyLog[3, I*E^(I*ArcSin[c*x])]) + (b^2*(2*ArcSin[c*x]*
(Sqrt[1 - c^2*x^2] + 3*Cos[3*ArcSin[c*x]]) - 3*ArcSin[c*x]^2*(-7*c*x + Sin[
3*ArcSin[c*x]]) + 2*(c*x + Sin[3*ArcSin[c*x]])))/(2*(-1 + c^2*x^2)^2))/(48*
c^3*d^3)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 843 vs. $2(348) = 696$.
time = 0.48, size = 844, normalized size = 2.48

method	result
derivativedivides	$\frac{\frac{b^2 \arcsin(cx)^2 c^3 x^3}{8d^3(c^4x^4-2c^2x^2+1)} - \frac{b^2 \operatorname{polylog}\left(3, i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3} + \frac{b^2 \operatorname{polylog}\left(3, -i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3} - \frac{a^2 \ln(cx+1)}{16d^3} + \cdots}{\cdots}$
default	$\frac{\frac{b^2 \arcsin(cx)^2 c^3 x^3}{8d^3(c^4x^4-2c^2x^2+1)} - \frac{b^2 \operatorname{polylog}\left(3, i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3} + \frac{b^2 \operatorname{polylog}\left(3, -i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3} - \frac{a^2 \ln(cx+1)}{16d^3} + \cdots}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(1/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^3*x^3-1/16*a^2/d^3
*ln(c*x+1)+1/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c*x+1/4*I*b^2/d^
3*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/4*I*b^2/d^3*arcsin(
c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/4*I*a*b/d^3*dilog(1+I*(I*c*
x+(-c^2*x^2+1)^(1/2)))+1/4*I*a*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-
1/4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2+1/
4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^3*x^3-1/4*a*b/d^3/(c^4*x^4-2*
c^2*x^2+1)*c^2*x^2*(-c^2*x^2+1)^(1/2)+1/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arc
sin(c*x)*c*x+1/3*I*b^2/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+1/12*b^2/d^3/(c
^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/12*a*b/d^3/(c^4*x^4-2*
c^2*x^2+1)*(-c^2*x^2+1)^(1/2)+1/4*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x
^2+1)^(1/2)))-1/4*a*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/
12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3+1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)
*c*x+1/16*a^2/d^3*ln(c*x-1)-1/16*a^2/d^3/(c*x+1)^2+1/16*a^2/d^3/(c*x+1)+1/1
6*a^2/d^3/(c*x-1)^2+1/16*a^2/d^3/(c*x-1)-1/4*b^2/d^3*polylog(3,I*(I*c*x+(-c
^2*x^2+1)^(1/2)))+1/4*b^2/d^3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/8*
b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/8*b^2/d^3*arcsin
(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a^2*(2*(c^2*x^3 + x)/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) - log(c*x
 + 1)/(c^3*d^3) + log(c*x - 1)/(c^3*d^3)) - 1/16*((b^2*c^4*x^4 - 2*b^2*c^2*
x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - (b^2
*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^
2*log(-c*x + 1) - 2*(b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2 + 16*(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)*integrate(1/8*(1
6*a*b*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + ((b^2*c^4*x^4 -
2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1
) - (b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))*log(-c*x + 1) - 2*(b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^8*d^3*x^6 - 3*c^6*d^3*x
^4 + 3*c^4*d^3*x^2 - c^2*d^3), x))/(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^6*d^
3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x^2}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{2abx^2\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**2*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**2*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.204 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=150

$$\frac{b^2}{12c^2d^3(1-c^2x^2)}-\frac{bx(a+b\text{ArcSin}(cx))}{6cd^3(1-c^2x^2)^{3/2}}-\frac{bx(a+b\text{ArcSin}(cx))}{3cd^3\sqrt{1-c^2x^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{4c^2d^3(1-c^2x^2)^2}-\frac{b^2\log(1-c^2x^2)}{6c^2d^3}$$

```
[Out] 1/12*b^2/c^2/d^3/(-c^2*x^2+1)-1/6*b*x*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1)^
(3/2)+1/4*(a+b*arcsin(c*x))^2/c^2/d^3/(-c^2*x^2+1)^2-1/6*b^2*ln(-c^2*x^2+1)
/c^2/d^3-1/3*b*x*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4767, 4747, 4745, 266, 267}

$$-\frac{bx(a+b\text{ArcSin}(cx))}{3cd^3\sqrt{1-c^2x^2}}-\frac{bx(a+b\text{ArcSin}(cx))}{6cd^3(1-c^2x^2)^{3/2}}+\frac{(a+b\text{ArcSin}(cx))^2}{4c^2d^3(1-c^2x^2)^2}+\frac{b^2}{12c^2d^3(1-c^2x^2)}-\frac{b^2\log(1-c^2x^2)}{6c^2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] b^2/(12*c^2*d^3*(1 - c^2*x^2)) - (b*x*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^
2*x^2)^(3/2)) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^3*Sqrt[1 - c^2*x^2]) + (a
+ b*ArcSin[c*x])^2/(4*c^2*d^3*(1 - c^2*x^2)^2) - (b^2*Log[1 - c^2*x^2])/(6*
c^2*d^3)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{(a+b\sin^{-1}(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{b\int \frac{a+b\sin^{-1}(cx)}{(1-c^2x^2)^{5/2}}\,dx}{2cd^3}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{(a+b\sin^{-1}(cx))^2}{4c^2d^3(1-c^2x^2)^2} + \frac{b^2\int \frac{x}{(1-c^2x^2)^2}\,dx}{6d^3} - \frac{b\int \frac{a+b\sin^{-1}(cx)}{(1-c^2x^2)^{3/2}}\,d}{3cd^3}$$

$$= \frac{b^2}{12c^2d^3(1-c^2x^2)} - \frac{bx(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{bx(a+b\sin^{-1}(cx))}{3cd^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx}{4c^2d^3(1-c^2x}$$

$$= \frac{b^2}{12c^2d^3(1-c^2x^2)} - \frac{bx(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{bx(a+b\sin^{-1}(cx))}{3cd^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(cx}{4c^2d^3(1-c^2x}$$

Mathematica [A]
time = 0.12, size = 162, normalized size = 1.08

$$\frac{3a^2+b^2-b^2c^2x^2-6abcx\sqrt{1-c^2x^2}+4abc^3x^3\sqrt{1-c^2x^2}+2b\left(3a+bcx\sqrt{1-c^2x^2}\,(-3+2c^2x^2)\right)\text{ArcSin}(cx)+3b^2\text{ArcSin}(cx)^2-2b^2(-1+c^2x^2)^2\log(1-c^2x^2)}{12c^2d^3(-1+c^2x^2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (3*a^2 + b^2 - b^2*c^2*x^2 - 6*a*b*c*x*Sqrt[1 - c^2*x^2] + 4*a*b*c^3*x^3*Sq
rt[1 - c^2*x^2] + 2*b*(3*a + b*c*x*Sqrt[1 - c^2*x^2]*(-3 + 2*c^2*x^2))*ArcS
```

```
in[c*x] + 3*b^2*ArcSin[c*x]^2 - 2*b^2*(-1 + c^2*x^2)^2*Log[1 - c^2*x^2])/(1
2*c^2*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 290 vs. $2(136) = 272$.
time = 0.09, size = 291, normalized size = 1.94

method	result
derivativedivides	$\frac{\frac{a^2}{4d^3(c^2x^2-1)^2}+\frac{b^2\arcsin(cx)^2}{4d^3(c^2x^2-1)^2}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{6d^3(c^2x^2-1)^2}-\frac{b^2}{12d^3(c^2x^2-1)}+\frac{b^2\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{3d^3(c^2x^2-1)}-\frac{b^2}{}}{}$
default	$\frac{\frac{a^2}{4d^3(c^2x^2-1)^2}+\frac{b^2\arcsin(cx)^2}{4d^3(c^2x^2-1)^2}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{6d^3(c^2x^2-1)^2}-\frac{b^2}{12d^3(c^2x^2-1)}+\frac{b^2\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{3d^3(c^2x^2-1)}-\frac{b^2}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/4*a^2/d^3/(c^2*x^2-1)^2+1/4*b^2/d^3*arcsin(c*x)^2/(c^2*x^2-1)^2-1/
6*b^2/d^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)^2*c*x-1/12*b^2/d^3/(c^
2*x^2-1)+1/3*b^2/d^3*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c*x-1/6*b^2
*ln(-c^2*x^2+1)/d^3-2*a*b/d^3*(-1/4/(c^2*x^2-1)^2*arcsin(c*x)+1/48/(c*x-1)^
2*(-(c*x-1)^2-2*c*x+2)^(1/2)-1/12/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)-1/12/(
c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)
))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^2/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) + 1/4*(b^2*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)*in
tegrate(-1/2*(4*a*b*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - sqrt(c
*x + 1)*sqrt(-c*x + 1)*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^7
*d^3*x^6 - 3*c^5*d^3*x^4 + 3*c^3*d^3*x^2 - c*d^3), x))/(c^6*d^3*x^4 - 2*c^4
*d^3*x^2 + c^2*d^3)
```

Fricas [A]
time = 3.14, size = 165, normalized size = 1.10

$$-\frac{b^2c^2x^2 - 3\,b^2\arcsin\left(cx\right)^2 - 6\,ab\arcsin\left(cx\right) - 3\,a^2 - b^2 + 2\,(b^2c^4x^4 - 2\,b^2c^2x^2 + b^2)\log\left(c^2x^2 - 1\right) - 2\,(2\,abc^3x^3 - 3\,abcx + (2\,b^2c^3x^3 - 3\,b^2cx)\arcsin\left(cx\right))\sqrt{-c^2x^2 + 1}}{12\,(c^6d^3x^4 - 2\,c^4d^3x^2 + c^2d^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] -1/12*(b^2*c^2*x^2 - 3*b^2*arcsin(c*x)^2 - 6*a*b*arcsin(c*x) - 3*a^2 - b^2
+ 2*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*log(c^2*x^2 - 1) - 2*(2*a*b*c^3*x^3
 - 3*a*b*c*x + (2*b^2*c^3*x^3 - 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))
/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{b^2x\,\mathrm{asin}^2\left(cx\right)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{2abx\,\mathrm{asin}\left(cx\right)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b**2*x*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Int
egral(2*a*b*x*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d*
*3
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 395 vs. 2(134) = 268.
time = 0.48, size = 395, normalized size = 2.63

$$\frac{b^2c^2x^4\arcsin\left(cx\right)^2}{4\,(c^2x^2-1)^2d^3} + \frac{abc^2x^4\arcsin\left(cx\right)}{2\,(c^2x^2-1)^2d^3} + \frac{a^2c^2x^4}{4\,(c^2x^2-1)^2d^3} + \frac{b^2cx^3\arcsin\left(cx\right)}{6\,(c^2x^2-1)\sqrt{-c^2x^2+1}\,d^3} - \frac{b^2x^2\arcsin\left(cx\right)^2}{2\,(c^2x^2-1)d^3} + \frac{abcx^3}{6\,(c^2x^2-1)\sqrt{-c^2x^2+1}\,d^3} - \frac{abx^2\arcsin\left(cx\right)}{(c^2x^2-1)d^3} - \frac{a^2x^2}{2\,(c^2x^2-1)d^3} - \frac{b^2x^2}{12\,(c^2x^2-1)d^3} - \frac{b^2x\arcsin\left(cx\right)}{2\,\sqrt{-c^2x^2+1}\,cd^3} + \frac{b^2\arcsin\left(cx\right)^2}{4\,c^2d^3} - \frac{abx}{2\,\sqrt{-c^2x^2+1}\,cd^3} + \frac{ab\arcsin\left(cx\right)}{2\,c^2d^3} - \frac{b^2\log\left(2\right)}{3\,c^2d^3} - \frac{b^2\log\left(|-c^2x^2+1|\right)}{6\,c^2d^3} + \frac{a^2}{4\,c^2d^3} + \frac{b^2}{12\,c^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b^2*c^2*x^4*arcsin(c*x)^2/((c^2*x^2 - 1)^2*d^3) + 1/2*a*b*c^2*x^4*arcsi
n(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a^2*c^2*x^4/((c^2*x^2 - 1)^2*d^3) + 1/6*
b^2*c*x^3*arcsin(c*x)/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*d^3) - 1/2*b^2*x^2*
arcsin(c*x)^2/((c^2*x^2 - 1)*d^3) + 1/6*a*b*c*x^3/((c^2*x^2 - 1)*sqrt(-c^2*
x^2 + 1)*d^3) - a*b*x^2*arcsin(c*x)/((c^2*x^2 - 1)*d^3) - 1/2*a^2*x^2/((c^2
*x^2 - 1)*d^3) - 1/12*b^2*x^2/((c^2*x^2 - 1)*d^3) - 1/2*b^2*x*arcsin(c*x)/(
sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b^2*arcsin(c*x)^2/(c^2*d^3) - 1/2*a*b*x/(sq
rt(-c^2*x^2 + 1)*c*d^3) + 1/2*a*b*arcsin(c*x)/(c^2*d^3) - 1/3*b^2*log(2)/(c
^2*d^3) - 1/6*b^2*log(abs(-c^2*x^2 + 1))/(c^2*d^3) + 1/4*a^2/(c^2*d^3) + 1/
12*b^2/(c^2*d^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.205 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=332

$$\frac{b^2x}{12d^3\left(1-c^2x^2\right)}-\frac{b(a+b\text{ArcSin}(cx))}{6cd^3\left(1-c^2x^2\right)^{3/2}}-\frac{3b(a+b\text{ArcSin}(cx))}{4cd^3\sqrt{1-c^2x^2}}+\frac{x(a+b\text{ArcSin}(cx))^2}{4d^3\left(1-c^2x^2\right)^2}+\frac{3x(a+b\text{ArcSin}(cx))^2}{8d^3\left(1-c^2x^2\right)}-$$

```
[Out] 1/12*b^2*x/d^3/(-c^2*x^2+1)-1/6*b*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1)^(3/2
)+1/4*x*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+3/8*x*(a+b*arcsin(c*x))^2/d^
3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c
/d^3+5/6*b^2*arctanh(c*x)/c/d^3+3/4*I*b*(a+b*arcsin(c*x))*polylog(2,-I*(I*c
*x+(-c^2*x^2+1)^(1/2)))/c/d^3-3/4*I*b*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+
(-c^2*x^2+1)^(1/2)))/c/d^3-3/4*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/c/d^3+3/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^3-3/4*b*(a+b*arc
sin(c*x))/c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.25, antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205}

$$-\frac{3i\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{4cd^3}-\frac{3b(a+b\text{ArcSin}(cx))}{4cd^3\sqrt{1-c^2x^2}}-\frac{b(a+b\text{ArcSin}(cx))}{6cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{3x(a+b\text{ArcSin}(cx))^2}{8d^3\left(1-c^2x^2\right)}+\frac{x(a+b\text{ArcSin}(cx))^2}{4d^3\left(1-c^2x^2\right)^2}+\frac{3ib\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4cd^3}-\frac{3ib\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4cd^3}-\frac{3b^2\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{4cd^3}+\frac{3b^2\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{4cd^3}+\frac{b^2x}{12d^3\left(1-c^2x^2\right)}+\frac{5b^2\tanh^{-1}(cx)}{6cd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^3,x]
```

```
[Out] (b^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^2*
x^2)^(3/2)) - (3*b*(a + b*ArcSin[c*x]))/(4*c*d^3*Sqrt[1 - c^2*x^2]) + (x*(a
 + b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x])^2)/
(8*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin
[c*x])])/(c*d^3) + (5*b^2*ArcTanh[c*x])/(6*c*d^3) + (((3*I)/4)*b*(a + b*Arc
Sin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) - (((3*I)/4)*b*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3) - (3*b^2*PolyLog[3,
(-I)*E^(I*ArcSin[c*x])])/(4*c*d^3) + (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])]
)/(4*c*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{2d^3} + \frac{3\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx}{4d}$$

$$= -\frac{b(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{3x(a+b\sin^{-1}(cx))^2}{8d^3(1-c^2x^2)} + \frac{b^2\int \frac{1}{(1-c^2x^2)^2}}{6d^3}$$

$$= \frac{b^2x}{12d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\sin^{-1}(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2}$$

$$= \frac{b^2x}{12d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\sin^{-1}(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2}$$

$$= \frac{b^2x}{12d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\sin^{-1}(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2}$$

$$= \frac{b^2x}{12d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\sin^{-1}(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2}$$

$$= \frac{b^2x}{12d^3(1-c^2x^2)} - \frac{b(a+b\sin^{-1}(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\sin^{-1}(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2}$$

Mathematica [A]
time = 3.28, size = 556, normalized size = 1.67

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((24*a^2*x)/(-1 + c^2*x^2)^2 - (36*a^2*x)/(-1 + c^2*x^2) - (18*a^2*Log[1 -
c*x])/c + (18*a^2*Log[1 + c*x])/c + ((72*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin
[c*x])])/c - (4*b^2*((2*c*x)/(-1 + c^2*x^2) + (4*ArcSin[c*x])/(1 - c^2*x^2)
^(3/2) + (18*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (6*c*x*ArcSin[c*x]^2)/(-1 + c
^2*x^2)^2 + (9*c*x*ArcSin[c*x]^2)/(-1 + c^2*x^2) + (18*I)*ArcSin[c*x]^2*Arc
Tan[E^(I*ArcSin[c*x])] - 20*ArcTanh[c*x] - (18*I)*ArcSin[c*x]*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])] + (18*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])]
+ 18*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 18*PolyLog[3, I*E^(I*ArcSin[c*x])
]))/c + (a*b*(30 - 70*Sqrt[1 - c^2*x^2] + 40*Cos[2*ArcSin[c*x]] - 18*Cos[3*
ArcSin[c*x]] + 10*Cos[4*ArcSin[c*x]] - (72*I)*(-1 + c^2*x^2)^2*PolyLog[2, I
*E^(I*ArcSin[c*x])] + 3*ArcSin[c*x]*(22*c*x + 9*Log[1 - I*E^(I*ArcSin[c*x])
] + 12*Cos[2*ArcSin[c*x]]*(Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 + I*E^(I*Ar
cSin[c*x])]) + 3*Cos[4*ArcSin[c*x]]*(Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 +
 I*E^(I*ArcSin[c*x])]) - 9*Log[1 + I*E^(I*ArcSin[c*x])] + 6*Sin[3*ArcSin[c*
x]])))/(c*(-1 + c^2*x^2)^2))/(96*d^3)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 843 vs. $2(339) = 678$.
time = 0.22, size = 844, normalized size = 2.54

method	result
derivativedivides	$\frac{-\frac{3b^2 \arcsin(cx)^2 c^3 x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}+\frac{3b^2 \operatorname{polylog}\left(3,i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}-\frac{3b^2 \operatorname{polylog}\left(3,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}+\frac{3a^2 \ln(c}{16d}\cdots}{\cdots}$
default	$\frac{-\frac{3b^2 \arcsin(cx)^2 c^3 x^3}{8d^3\left(c^4x^4-2c^2x^2+1\right)}+\frac{3b^2 \operatorname{polylog}\left(3,i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}-\frac{3b^2 \operatorname{polylog}\left(3,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{4d^3}+\frac{3a^2 \ln(c}{16d}\cdots}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-3/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^3*x^3+3/16*a^2/d^3*
ln(c*x+1)-5/3*I*b^2/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+5/8*b^2/d^3/(c^4*x
^4-2*c^2*x^2+1)*arcsin(c*x)^2*c*x+3/4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-3/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*
x)*c^3*x^3+3/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2*(-c^2*x^2+1)^(1/2)+5/4
*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c*x-11/12*b^2/d^3/(c^4*x^4-2*c^2
*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-3/4*I*b^2/d^3*arcsin(c*x)*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I*b^2/d^3*arcsin(c*x)*polylog(2,-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))-11/12*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2
)-3/4*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*a*b/d^3*ar
csin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I*a*b/d^3*dilog(1+I*(I*c*x
+(-c^2*x^2+1)^(1/2)))-3/4*I*a*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1
/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3+1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1
)*c*x-3/16*a^2/d^3*ln(c*x-1)-1/16*a^2/d^3/(c*x+1)^2-3/16*a^2/d^3/(c*x+1)+1/
```

```
16*a^2/d^3/(c*x-1)^2-3/16*a^2/d^3/(c*x-1)+3/4*b^2/d^3*polylog(3,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))-3/4*b^2/d^3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/8
*b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*b^2/d^3*arcsi
n(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a^2*(2*(3*c^2*x^3 - 5*x)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) - 3*log(
c*x + 1)/(c*d^3) + 3*log(c*x - 1)/(c*d^3)) + 1/16*(3*(b^2*c^4*x^4 - 2*b^2*c
^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3
*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 5*b^2*c*x)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))^2 + 16*(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3)*integrate
(-1/8*(16*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (3*(b^2*c^4*x^4
- 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 5*b^2*c*x)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^6 - 3*c
^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x))/(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3
)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^6 - 3*c^
4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))^2}{(d - c^2\,d\,x^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^3,x)
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^3, x)
```

3.206 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=296

$$\frac{b^2}{12d^3(1-c^2x^2)}-\frac{bcx(a+b\text{ArcSin}(cx))}{6d^3(1-c^2x^2)^{3/2}}-\frac{4bcx(a+b\text{ArcSin}(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{4d^3(1-c^2x^2)^2}+\frac{(a+b\text{ArcSin}(cx))^2}{2d^3(1-c^2x^2)}-$$

```
[Out] 1/12*b^2/d^3/(-c^2*x^2+1)-1/6*b*c*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2
)+1/4*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+1/2*(a+b*arcsin(c*x))^2/d^3/(-
c^2*x^2+1)-2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-
2/3*b^2*ln(-c^2*x^2+1)/d^3+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^
2+1)^(1/2))^2)/d^3-I*b*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2
))^2)/d^3-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+1/2*b^2*poly
log(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-4/3*b*c*x*(a+b*arcsin(c*x))/d^3/(-c
^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.36, antiderivative size = 296, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266, 4747, 267}

$$-\frac{4bcx(a+b\text{ArcSin}(cx))}{3d^3\sqrt{1-c^2x^2}}-\frac{bcx(a+b\text{ArcSin}(cx))}{6d^3(1-c^2x^2)^{3/2}}+\frac{(a+b\text{ArcSin}(cx))^2}{2d^3(1-c^2x^2)}+\frac{(a+b\text{ArcSin}(cx))^2}{4d^3(1-c^2x^2)^2}+\frac{ib\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}-\frac{2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d^3}-\frac{b^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d^3}+\frac{b^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^3}+\frac{b^2}{12d^3(1-c^2x^2)}-\frac{2b^2\log(1-c^2x^2)}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] b^2/(12*d^3*(1 - c^2*x^2)) - (b*c*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^
2)^(3/2)) - (4*b*c*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (a +
b*ArcSin[c*x])^2/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])^2/(2*d^3*(1
- c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3
- (2*b^2*Log[1 - c^2*x^2])/(3*d^3) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E
^((2*I)*ArcSin[c*x])])/d^3 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*A
rcSin[c*x])])/d^3 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d^3) + (b^2
*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^3)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
```

```
1] && NeQ[p, -3/2]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^3}\,dx = \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} - \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2d^3} + \frac{\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^2}\,dx}{d}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{4d^3\left(1-c^2x^2\right)^2} + \frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^3\left(1-c^2x^2\right)} - \frac{(bc)\int \frac{a+b\sin^{-1}}{(1-c^2x}}{3d^3}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(c}{4d^3\left(1-c^2x\right.}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(c}{4d^3\left(1-c^2x\right.}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(c}{4d^3\left(1-c^2x\right.}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(c}{4d^3\left(1-c^2x\right.}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(c}{4d^3\left(1-c^2x\right.}$$

$$= \frac{b^2}{12d^3\left(1-c^2x^2\right)} - \frac{bcx(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bcx(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\sin^{-1}(c}{4d^3\left(1-c^2x\right.}$$

Mathematica [A]
time = 2.36, size = 459, normalized size = 1.55

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/24*((-6*a^2)/(-1 + c^2*x^2)^2 + (12*a^2)/(-1 + c^2*x^2) - 24*a^2*Log[c*x
] + 12*a^2*Log[1 - c^2*x^2] + 4*a*b*((c*x)/(1 - c^2*x^2)^(3/2) + (8*c*x)/Sq
rt[1 - c^2*x^2] - (3*ArcSin[c*x])/(-1 + c^2*x^2)^2 + (6*ArcSin[c*x])/(-1 +
c^2*x^2) - 12*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 12*ArcSin[c*x]*L
og[1 + E^((2*I)*ArcSin[c*x])] - (6*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] +
(6*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + b^2*(I*Pi^3 + 2/(-1 + c^2*x^2) +
 (4*c*x*ArcSin[c*x])/(1 - c^2*x^2)^(3/2) + (32*c*x*ArcSin[c*x])/Sqrt[1 - c^
2*x^2] - (6*ArcSin[c*x]^2)/(-1 + c^2*x^2)^2 + (12*ArcSin[c*x]^2)/(-1 + c^2*
x^2) - (16*I)*ArcSin[c*x]^3 - 24*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x
])] + 24*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] + 16*Log[1 - c^2*x^2]
```

```
 - (24*I)*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (24*I)*ArcSin[c*
x]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - 12*PolyLog[3, E^((-2*I)*ArcSin[c*x]
)] + 12*PolyLog[3, -E^((2*I)*ArcSin[c*x])]))/d^3
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1223 vs. $2(324) = 648$.
time = 0.38, size = 1224, normalized size = 4.14

method	result	size
derivativedivides	Expression too large to display	1224
default	Expression too large to display	1224

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] a^2/d^3*ln(c*x)+1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)-4/3*b^2/d^3*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))^2)+8/3*b^2/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2/d^3*p
olylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+2*b^2/d^3*polylog(3,I*c*x+(-c^2*x^2+1)^
(1/2))-1/2*a^2/d^3*ln(c*x+1)+3/4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^
2+b^2/d^3*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+b^2/d^3*arcsin(c*x)^
2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-b^2/d^3*arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^
2+1)^(1/2))^2)-1/2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^2*x^2-1/12
*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2+3/2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*ar
csin(c*x)+2*a*b/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b/d^3*ar
csin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*a*b/d^3*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)+2*a*b/d^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-4
/3*I*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)-2*I*a*b/d^3*polylog(2,-I*c*x-(-c^2*x^2+1
)^(1/2))-2*I*a*b/d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+I*b^2/d^3*arcsin(c
*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4/3*I*b^2/d^3/(c^4*x^4-2*c^2*x
^2+1)*arcsin(c*x)-2*I*b^2/d^3*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/
2))-2*I*b^2/d^3*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+4/3*a*b/d^3
/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3*(-c^2*x^2+1)^(1/2)-a*b/d^3/(c^4*x^4-2*c^2*x^
2+1)*arcsin(c*x)*c^2*x^2-3/2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c*x*(-c^2*x^2+1)
^(1/2)-4/3*I*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^4*x^4+8/3*I*a*b/d^3/(c^4*x^4-2
*c^2*x^2+1)*c^2*x^2+4/3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)*c^3*x^3-3/2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*c*x-4/3*I*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^4*x^4+8/3*I*b
^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^2*x^2-1/2*b^2*polylog(3,-(I*c*x+
(-c^2*x^2+1)^(1/2))^2)/d^3-1/2*a^2/d^3*ln(c*x-1)+1/16*a^2/d^3/(c*x+1)^2+5/1
6*a^2/d^3/(c*x+1)+1/16*a^2/d^3/(c*x-1)^2-5/16*a^2/d^3/(c*x-1)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*((2*c^2*x^2 - 3)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) + 2*log(c*x +
 1)/d^3 + 2*log(c*x - 1)/d^3 - 4*log(x)/d^3) - integrate((b^2*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^7 - 3*c^
4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^6x^7-3c^4x^5+3c^2x^3-x}\,dx+\int \frac{b^2\operatorname{asin}^2{(cx)}}{c^6x^7-3c^4x^5+3c^2x^3-x}\,dx+\int \frac{2ab\operatorname{asin}{(cx)}}{c^6x^7-3c^4x^5+3c^2x^3-x}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2/(c**6*x**7 - 3*c**4*x**5 + 3*c**2*x**3 - x), x) + Integral(
b**2*asin(c*x)**2/(c**6*x**7 - 3*c**4*x**5 + 3*c**2*x**3 - x), x) + Integra
l(2*a*b*asin(c*x)/(c**6*x**7 - 3*c**4*x**5 + 3*c**2*x**3 - x), x))/d**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x\,{\left(d-c^2\,d\,x^2\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^3), x)
```

3.207 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=429

$$\frac{b^2c^2x}{12d^3(1-c^2x^2)}-\frac{bc(a+b\text{ArcSin}(cx))}{6d^3(1-c^2x^2)^{3/2}}-\frac{7bc(a+b\text{ArcSin}(cx))}{4d^3\sqrt{1-c^2x^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{d^3x(1-c^2x^2)^2}+\frac{5c^2x(a+b\text{ArcSin}(cx)}{4d^3(1-c^2x^2)^2}$$

```
[Out] 1/12*b^2*c^2*x/d^3/(-c^2*x^2+1)-1/6*b*c*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^
(3/2)-(a+b*arcsin(c*x))^2/d^3/x/(-c^2*x^2+1)^2+5/4*c^2*x*(a+b*arcsin(c*x))^
2/d^3/(-c^2*x^2+1)^2+15/8*c^2*x*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)-15/4*I
*c*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^3-4*b*c*(a+b*arcs
in(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^3+11/6*b^2*c*arctanh(c*x)/d^3+
2*I*b^2*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d^3+15/4*I*b*c*(a+b*arcsin(c
*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-15/4*I*b*c*(a+b*arcsin(c*
x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-2*I*b^2*c*polylog(2,I*c*x+(
-c^2*x^2+1)^(1/2))/d^3-15/4*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/
d^3+15/4*b^2*c*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-7/4*b*c*(a+b*arc
sin(c*x))/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.53, antiderivative size = 429, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 15, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205, 4793, 4803, 4268, 2317, 2438}

$$-\frac{15ic\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{4d^3}-\frac{7bc(a+b\text{ArcSin}(cx))}{4d^3\sqrt{1-c^2x^2}}-\frac{bc(a+b\text{ArcSin}(cx))}{6d^3(1-c^2x^2)^{3/2}}+\frac{15c^2x(a+b\text{ArcSin}(cx))^2}{8d^3(1-c^2x^2)}+\frac{5c^2x(a+b\text{ArcSin}(cx))^2}{4d^3(1-c^2x^2)^2}-\frac{(a+b\text{ArcSin}(cx))^2}{d^3x(1-c^2x^2)^2}+\frac{15ibc\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4d^3}-\frac{15ibc\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4d^3}-\frac{4bc\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}+\frac{2ib^2c\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{d^3}-\frac{2ib^2c\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{d^3}-\frac{15b^2c\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{4d^3}+\frac{15b^2c\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{4d^3}+\frac{b^2c^2x}{12d^3(1-c^2x^2)}+\frac{11b^2c\tanh^{-1}(cx)}{6d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] (b^2*c^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(6*d^3*(1 -
c^2*x^2)^(3/2)) - (7*b*c*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) - (
a + b*ArcSin[c*x])^2/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x])
^2)/(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 -
c^2*x^2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/
d^3 - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^3 + (11*b^2*
c*ArcTanh[c*x])/(6*d^3) + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3
+ (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d
^3 - (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
^3 - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (15*b^2*c*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(4*d^3) + (15*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x]
)])/(4*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
```

```
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^3}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{d^3x(1-c^2x^2)^2} + (5c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x(1-c^2x^2)^{5/2}}\,dx}{d^3}$$

$$= \frac{2bc(a+b\sin^{-1}(cx))}{3d^3(1-c^2x^2)^{3/2}} - \frac{(a+b\sin^{-1}(cx))^2}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(2bc)\int \frac{a+}{x(1}}{c}$$

$$= -\frac{b^2c^2x}{3d^3(1-c^2x^2)} - \frac{bc(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} + \frac{2bc(a+b\sin^{-1}(cx))}{d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx)}{d^3x(1-c^2x^2)}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\sin^{-1}(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx)}{d^3x(1-c^2x^2)^2}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\sin^{-1}(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx)}{d^3x(1-c^2x^2)^2}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\sin^{-1}(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx)}{d^3x(1-c^2x^2)^2}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\sin^{-1}(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx)}{d^3x(1-c^2x^2)^2}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\sin^{-1}(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\sin^{-1}(cx)}{d^3x(1-c^2x^2)^2}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1351 vs. $2(429) = 858$.
time = 9.97, size = 1351, normalized size = 3.15

Too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -(a^2/(d^3*x)) + (a^2*c^2*x)/(4*d^3*(-1 + c^2*x^2)^2) - (7*a^2*c^2*x)/(8*d^
3*(-1 + c^2*x^2)) - (15*a^2*c*Log[1 - c*x])/(16*d^3) + (15*a^2*c*Log[1 + c*
x])/(16*d^3) - (b^2*c*((-2*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (44*ArcSin[c
*x] + 15*ArcSin[c*x]^3 - 45*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] - 45
*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I/2)*ArcS
in[c*x]))] + 45*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 45*ArcSin[c*x]
^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] - 45*P
i*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSi
```

```
n[c*x])] - 45*ArcSin[c*x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^
((I/2)*ArcSin[c*x]))] + 45*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
 + 44*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 45*ArcSin[c*x]^2*Log[C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 44*Log[Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2]] + 45*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]] + 45*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (90*I)*ArcSin[c*
x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (90*I)*ArcSin[c*x]*PolyLog[2, I*E^(
I*ArcSin[c*x])] + 90*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 90*PolyLog[3, I*E
^(I*ArcSin[c*x])])/24 - (4 + 88*c*x*ArcSin[c*x] - 54*ArcSin[c*x]^2 + 30*c*x
*ArcSin[c*x]^3 - 240*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 4*Cos[4*ArcSin[c*x]
] - 90*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 96*c*x*ArcSin[c*x]*Log[1 - E^(I*A
rcSin[c*x])] - 96*c*x*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (768*I)*c*x*
(1 - c^2*x^2)^2*PolyLog[2, E^(I*ArcSin[c*x])] - 200*ArcSin[c*x]*Sin[2*ArcSi
n[c*x]] + 132*ArcSin[c*x]*Sin[3*ArcSin[c*x]] + 45*ArcSin[c*x]^3*Sin[3*ArcSi
n[c*x]] + 144*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] - 1
44*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] - 84*ArcSin[c*
x]*Sin[4*ArcSin[c*x]] + 44*ArcSin[c*x]*Sin[5*ArcSin[c*x]] + 15*ArcSin[c*x]^
3*Sin[5*ArcSin[c*x]] + 48*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[5*ArcS
in[c*x]] - 48*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]])/(3
84*c*x*(1 - c^2*x^2)^2)))/d^3 - (a*b*c*(24*ArcSin[c*x]*Cot[ArcSin[c*x]/2] -
 90*ArcSin[c*x]*(Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])
]) + 48*Log[Cos[ArcSin[c*x]/2]] - 48*Log[Sin[ArcSin[c*x]/2]] - (90*I)*(Poly
Log[2, (-I)*E^(I*ArcSin[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])]) - (3*ArcS
in[c*x])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4 - (-1 + 21*ArcSin[c*x]
)/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2 + (2*Sin[ArcSin[c*x]/2])/(Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (44*Sin[ArcSin[c*x]/2])/(Cos[ArcS
in[c*x]/2] - Sin[ArcSin[c*x]/2]) + (3*ArcSin[c*x])/(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2])^4 - (2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcS
in[c*x]/2])^3 + (1 + 21*ArcSin[c*x])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2])^2 - (44*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) +
 24*ArcSin[c*x]*Tan[ArcSin[c*x]/2]))/(24*d^3)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1073 vs. $2(458) = 916$.
time = 0.42, size = 1074, normalized size = 2.50 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-15/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^3*x^3+15/16*a^2/d^3*
ln(c*x+1)-b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/c/x*arcsin(c*x)^2+25/8*b^2/d^3/(c^4
*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c*x-15/4*I*b^2/d^3*arcsin(c*x)*polylog(2,I*
(I*c*x+(-c^2*x^2+1)^(1/2)))+15/4*I*b^2/d^3*arcsin(c*x)*polylog(2,-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-15/4*I*a*b/d^3*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1
5/4*I*a*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7/4*b^2/d^3/(c^4*x^4-2*
c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-15/4*a*b/d^3/(c^4*x^4-2*c
```

```
^2*x^2+1)*arcsin(c*x)*c^3*x^3+7/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2*(-c
^2*x^2+1)^(1/2)+25/4*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c*x-2*b^2/d^
3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2/d^3*dilog(I*c*x+(-c^2*
x^2+1)^(1/2))+2*I*b^2/d^3*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-11/3*I*b^2/d^3*
arctan(I*c*x+(-c^2*x^2+1)^(1/2))-a^2/d^3/c/x+2*a*b/d^3*ln(I*c*x+(-c^2*x^2+1
)^(1/2)-1)-2*a*b/d^3*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b/d^3/(c^4*x^4-2*c^
2*x^2+1)/c/x*arcsin(c*x)-23/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)-23/12*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-15/
4*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/4*a*b/d^3*arcsi
n(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1
)*c^3*x^3+1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c*x-15/16*a^2/d^3*ln(c*x-1)-1/
16*a^2/d^3/(c*x+1)^2-7/16*a^2/d^3/(c*x+1)+1/16*a^2/d^3/(c*x-1)^2-7/16*a^2/d
^3/(c*x-1)+15/4*b^2/d^3*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-15/4*b^2/d^
3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/8*b^2/d^3*arcsin(c*x)^2*ln(1-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))-15/8*b^2/d^3*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^
2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a^2*(2*(15*c^4*x^4 - 25*c^2*x^2 + 8)/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d
^3*x) - 15*c*log(c*x + 1)/d^3 + 15*c*log(c*x - 1)/d^3) + 1/16*(15*(b^2*c^5*
x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
*log(c*x + 1) - 15*(b^2*c^5*x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(15*b^2*c^4*x^4 - 25*b^2*c^2
*x^2 + 8*b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 16*(c^4*d^3*x^
5 - 2*c^2*d^3*x^3 + d^3*x)*integrate(-1/8*(16*a*b*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) - (15*(b^2*c^6*x^6 - 2*b^2*c^4*x^4 + b^2*c^2*x^2)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(b^2*c^6*x^6 - 2*b^2*
c^4*x^4 + b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x
+ 1) - 2*(15*b^2*c^5*x^5 - 25*b^2*c^3*x^3 + 8*b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^8 - 3*c^4*
d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x))/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*
x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")

[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**3,x)

[Out] -(Integral(a**2/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x) + Integral(b**2*asin(c*x)**2/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x) + Integral(2*a*b*asin(c*x)/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x))/d**3

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")

[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x^2), x)

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x^2\,{\left(d-c^2\,d\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^3),x)

[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^3), x)

3.208 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{x^3(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=403

$$\frac{b^2c^2}{12d^3(1-c^2x^2)}-\frac{bc(a+b\text{ArcSin}(cx))}{d^3x(1-c^2x^2)^{3/2}}+\frac{5bc^3x(a+b\text{ArcSin}(cx))}{6d^3(1-c^2x^2)^{3/2}}-\frac{4bc^3x(a+b\text{ArcSin}(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\text{ArcSi}}{4d^3(1-c^2x}$$

```
[Out] 1/12*b^2*c^2/d^3/(-c^2*x^2+1)-b*c*(a+b*arcsin(c*x))/d^3/x/(-c^2*x^2+1)^(3/2
)+5/6*b*c^3*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2)+3/4*c^2*(a+b*arcsin(
c*x))^2/d^3/(-c^2*x^2+1)^2-1/2*(a+b*arcsin(c*x))^2/d^3/x^2/(-c^2*x^2+1)^2+3
/2*c^2*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)-6*c^2*(a+b*arcsin(c*x))^2*arcta
nh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+b^2*c^2*ln(x)/d^3-7/6*b^2*c^2*ln(-c^2*
x^2+1)/d^3+3*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)/d^3-3*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2
)/d^3-3/2*b^2*c^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+3/2*b^2*c^2*
polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-4/3*b*c^3*x*(a+b*arcsin(c*x))/d
^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.55, antiderivative size = 403, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 19, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.704$, Rules used = {4789, 4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266, 4747, 267, 277, 198, 197, 4779, 12, 1265, 907}

$$\frac{3ibc^2\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}-\frac{3ibc^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}+\frac{3c^2(a+b\text{ArcSin}(cx))^2}{2d^3(1-c^2x^2)}+\frac{3c^2(a+b\text{ArcSin}(cx))^2}{4d^3(1-c^2x^2)^2}-\frac{bc(a+b\text{ArcSin}(cx))}{d^3x(1-c^2x^2)^{3/2}}-\frac{(a+b\text{ArcSin}(cx))^2}{2d^3x^2(1-c^2x^2)^2}-\frac{6c^2\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d^3}-\frac{4bc^3x(a+b\text{ArcSin}(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{5bc^3x(a+b\text{ArcSin}(cx))}{6d^3(1-c^2x^2)^{3/2}}-\frac{3b^2c^2\text{Li}_3\left(-e^{2i\text{ArcSin}(cx)}\right)}{2d^3}+\frac{3b^2c^2\text{Li}_3\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^3}+\frac{b^2c^2}{12d^3(1-c^2x^2)}-\frac{7b^2c^2\log(1-c^2x^2)}{6d^3}+\frac{b^2c^2\log(x)}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] (b^2*c^2)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(d^3*x*(1 - c^
2*x^2)^(3/2)) + (5*b*c^3*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2))
 - (4*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a +
b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])^2/(2*d^3*x^
2*(1 - c^2*x^2)^2) + (3*c^2*(a + b*ArcSin[c*x])^2)/(2*d^3*(1 - c^2*x^2)) -
(6*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (b^2*c^2
*Log[x])/d^3 - (7*b^2*c^2*Log[1 - c^2*x^2])/(6*d^3) + ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^3 - (3*b^2*c^2*PolyLog[3,
-E^((2*I)*ArcSin[c*x])])/(2*d^3) + (3*b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*
x])])/(2*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
```

```
1] && NeQ[p, -3/2]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^3}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2d^3x^2\left(1-c^2x^2\right)^2} + \left(3c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^3}\,dx + \frac{(bc)\int \frac{a+b\sin^{-1}(cx)}{x^2\left(1-c^2x^2\right)^{5/2}}\,dx}{d^3}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{4bc^3x(a+b\sin^{-1}(cx))}{3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{8bc^3x(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a}{4d}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} + \frac{8bc^3x(a+b\sin^{-1}(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a}{4d}$$

$$= \frac{b^2c^2}{4d^3\left(1-c^2x^2\right)} - \frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x(a+b\sin}{3d^3\sqrt{1-c^2}}$$

$$= \frac{b^2c^2}{4d^3\left(1-c^2x^2\right)} - \frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x(a+b\sin}{3d^3\sqrt{1-c^2}}$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x(a+b\sin}{3d^3\sqrt{1-}}$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x(a+b\sin}{3d^3\sqrt{1-}}$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x(a+b\sin}{3d^3\sqrt{1-}}$$

$$= \frac{b^2c^2}{12d^3\left(1-c^2x^2\right)} - \frac{bc(a+b\sin^{-1}(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}} + \frac{5bc^3x(a+b\sin^{-1}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^3x(a+b\sin}{3d^3\sqrt{1-}}$$

Mathematica [A]
time = 4.40, size = 569, normalized size = 1.41

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/12*((6*a^2)/x^2 - (3*a^2*c^2)/(-1 + c^2*x^2)^2 + (12*a^2*c^2)/(-1 + c^2*
x^2) - 36*a^2*c^2*Log[x] + 18*a^2*c^2*Log[1 - c^2*x^2] + 2*a*b*c^2*((c*x)/(
1 - c^2*x^2)^(3/2) + (14*c*x)/Sqrt[1 - c^2*x^2] + (6*Sqrt[1 - c^2*x^2])/(c*
x) + (6*ArcSin[c*x])/(c^2*x^2) - (3*ArcSin[c*x])/(-1 + c^2*x^2)^2 + (12*Arc
Sin[c*x])/(-1 + c^2*x^2) - 36*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] +
36*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - (18*I)*PolyLog[2, -E^((2*I)
```

```
*ArcSin[c*x])] + (18*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]) + 12*b^2*c^2*((-
3*I)*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (3*I)*ArcSin[c*x]*Pol
yLog[2, -E^((2*I)*ArcSin[c*x])] + ((3*I)*Pi^3 + 2/(-1 + c^2*x^2) + (4*c*x*A
rcSin[c*x])/(1 - c^2*x^2)^(3/2) + (56*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] +
(24*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + (12*ArcSin[c*x]^2)/(c^2*x^2) - (
6*ArcSin[c*x]^2)/(-1 + c^2*x^2)^2 + (24*ArcSin[c*x]^2)/(-1 + c^2*x^2) - (48
*I)*ArcSin[c*x]^3 - 72*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 72*A
rcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - 24*Log[c*x] + 28*Log[1 - c^2*
x^2] - 36*PolyLog[3, E^((-2*I)*ArcSin[c*x])] + 36*PolyLog[3, -E^((2*I)*ArcS
in[c*x])])/24))/d^3
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1466 vs. $2(427) = 854$.
time = 0.44, size = 1467, normalized size = 3.64

method	result	size
derivativedivides	Expression too large to display	1467
default	Expression too large to display	1467

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/2*a^2/d^3/c^2/x^2-1/2*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2/x^2*arcsin(
c*x)^2+3*a^2/d^3*ln(c*x)+1/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)-7/3*b^2/d^3*ln(
1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+8/3*b^2/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2))+6*
b^2/d^3*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+6*b^2/d^3*polylog(3,I*c*x+(-c^
2*x^2+1)^(1/2))-3/2*a^2/d^3*ln(c*x+1)+b^2/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1
)+b^2/d^3*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+9/4*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*
arcsin(c*x)^2+3*b^2/d^3*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3*b^2/
d^3*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-3*b^2/d^3*arcsin(c*x)^2*ln
(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-6*I*a*b/d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^
(1/2))+3*I*a*b/d^3*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-6*I*a*b/d^3*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-6*I*b^2/d^3*arcsin(c*x)*polylog(2,-I*c*x-(
-c^2*x^2+1)^(1/2))-6*I*b^2/d^3*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/
2))+3*I*b^2/d^3*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-3/2*b^
2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^2*x^2-1/12*b^2/d^3/(c^4*x^4-2*c
^2*x^2+1)*c^2*x^2+9/2*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)+6*a*b/d^3*a
rcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-6*a*b/d^3*arcsin(c*x)*ln(1+(I*c*x
+(-c^2*x^2+1)^(1/2))^2)+6*a*b/d^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2)
)-4/3*I*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)-4/3*I*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*a
rcsin(c*x)-a*b/d^3/(c^4*x^4-2*c^2*x^2+1)/c/x*(-c^2*x^2+1)^(1/2)-a*b/d^3/(c^
4*x^4-2*c^2*x^2+1)/c^2/x^2*arcsin(c*x)-b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/c/x*ar
csin(c*x)*(-c^2*x^2+1)^(1/2)+4/3*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3*(-c^
2*x^2+1)^(1/2)-3*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^2*x^2-1/2*a*b/
d^3/(c^4*x^4-2*c^2*x^2+1)*c*x*(-c^2*x^2+1)^(1/2)-4/3*I*a*b/d^3/(c^4*x^4-2*c
```

```
^2*x^2+1)*c^4*x^4+8/3*I*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2*x^2+4/3*b^2/d^3/(
c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^3-1/2*b^2/d^3/(c^
4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-4/3*I*b^2/d^3/(c^4*x^
4-2*c^2*x^2+1)*arcsin(c*x)*c^4*x^4+8/3*I*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcs
in(c*x)*c^2*x^2-3/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-3/2*a^
2/d^3*ln(c*x-1)+1/16*a^2/d^3/(c*x+1)^2+9/16*a^2/d^3/(c*x+1)+1/16*a^2/d^3/(c
*x-1)^2-9/16*a^2/d^3/(c*x-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*((6*c^4*x^4 - 9*c^2*x^2 + 2)/(c^4*d^3*x^6 - 2*c^2*d^3*x^4 + d^3*x^
2) + 6*c^2*log(c*x + 1)/d^3 + 6*c^2*log(c*x - 1)/d^3 - 12*c^2*log(x)/d^3) -
 integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*
d^3*x^5 - d^3*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^9 - 3*c^
4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx+\int \frac{b^2\operatorname{asin}^2(cx)}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx+\int \frac{2ab\operatorname{asin}(cx)}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x) + Integr
al(b**2*asin(c*x)**2/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x) + I
ntegral(2*a*b*asin(c*x)/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x))
/d**3
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x^3), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^3\,\left(d-c^2\,d\,x^2\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^3), x)
```

3.209 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=572

$$-\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{b^2c^4x}{12d^3\left(1-c^2x^2\right)}+\frac{bc^3(a+b\text{ArcSin}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc(a+b\text{ArcSin}(cx))}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{29bc^3(a+b\text{ArcSi}}{12d^3\sqrt{1-c^2}}$$

```
[Out] -1/2*b^2*c^2/d^3/x+1/6*b^2*c^2/d^3/x/(-c^2*x^2+1)-1/12*b^2*c^4*x/d^3/(-c^2*
x^2+1)+1/6*b*c^3*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2)-1/3*b*c*(a+b*arcs
in(c*x))/d^3/x^2/(-c^2*x^2+1)^(3/2)-1/3*(a+b*arcsin(c*x))^2/d^3/x^3/(-c^2*x
^2+1)^2-7/3*c^2*(a+b*arcsin(c*x))^2/d^3/x/(-c^2*x^2+1)^2+35/12*c^4*x*(a+b*a
rcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+35/8*c^4*x*(a+b*arcsin(c*x))^2/d^3/(-c^2*x
^2+1)+35/4*I*b*c^3*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))/d^3-38/3*b*c^3*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^3+1
7/6*b^2*c^3*arctanh(c*x)/d^3+19/3*I*b^2*c^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(
1/2))/d^3-19/3*I*b^2*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))/d^3-35/4*I*c^3
*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^3-35/4*I*b*c^3*(a+b
*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-35/4*b^2*c^3*poly
log(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3+35/4*b^2*c^3*polylog(3,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/d^3-29/12*b*c^3*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.88, antiderivative size = 572, normalized size of antiderivative = 1.00, number of steps used = 43, number of rules used = 17, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.630$, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205, 4793, 4803, 4268, 2317, 2438, 296, 331}

$$-\frac{35ic^3\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{4d^3}+\frac{35ibc^3\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4d^3}-\frac{35ibc^3\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{4d^3}-\frac{38bc^3\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d^3}-\frac{7c^2(a+b\text{ArcSin}(cx))^2}{3d^3x\left(1-c^2x^2\right)^2}-\frac{bc(a+b\text{ArcSin}(cx))}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{(a+b\text{ArcSin}(cx))^2}{3d^3x^3\left(1-c^2x^2\right)^2}+\frac{35c^4x(a+b\text{ArcSin}(cx))^2}{8d^3\left(1-c^2x^2\right)}+\frac{35c^4x(a+b\text{ArcSin}(cx))^2}{12d^3\left(1-c^2x^2\right)^2}-\frac{29bc^3(a+b\text{ArcSin}(cx))}{12d^3\sqrt{1-c^2x^2}}+\frac{bc^3(a+b\text{ArcSin}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}}+\frac{19ib^2c^3\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)}{3d^3}-\frac{19ib^2c^3\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)}{3d^3}-\frac{35b^2c^3\text{Li}_3\left(-ie^{i\text{ArcSin}(cx)}\right)}{4d^3}+\frac{35b^2c^3\text{Li}_3\left(ie^{i\text{ArcSin}(cx)}\right)}{4d^3}+\frac{17b^2c^3\tanh^{-1}(cx)}{6d^3}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{b^2c^2}{2d^3x}-\frac{b^2c^4x}{12d^3\left(1-c^2x^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/2*(b^2*c^2)/(d^3*x) + (b^2*c^2)/(6*d^3*x*(1 - c^2*x^2)) - (b^2*c^4*x)/(1
2*d^3*(1 - c^2*x^2)) + (b*c^3*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/
2)) - (b*c*(a + b*ArcSin[c*x]))/(3*d^3*x^2*(1 - c^2*x^2)^(3/2)) - (29*b*c^3
*(a + b*ArcSin[c*x]))/(12*d^3*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])^2/(3
*d^3*x^3*(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x])^2)/(3*d^3*x*(1 - c^2
*x^2)^2) + (35*c^4*x*(a + b*ArcSin[c*x])^2)/(12*d^3*(1 - c^2*x^2)^2) + (35*
c^4*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b
*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^3 - (38*b*c^3*(a + b*ArcSin[c*
x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^3) + (17*b^2*c^3*ArcTanh[c*x])/(6*d^3)
 + (((19*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3 + (((35*I)/4)*b*
c^3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - (((35*I)/
4)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3 - (((19*I
```

```
)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (35*b^2*c^3*PolyLog[3, (-
I)*E^(I*ArcSin[c*x])])/(4*d^3) + (35*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])
])/(4*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 296

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-(
c*x)^(m + 1))*((a + b*x^n)^(p + 1)/(a*c*n*(p + 1))), x] + Dist[(m + n*(p +
1) + 1)/(a*n*(p + 1)), Int[(c*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a,
 b, c, m}, x] && IGtQ[n, 0] && LtQ[p, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^4(d-c^2dx^2)^3}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{3d^3x^3(1-c^2x^2)^2} + \frac{1}{3}(7c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^3}\,dx + \frac{(2bc)\int \frac{a+b\sin^{-1}(cx)}{x^3(1-c^2x^2)^{5/2}}\,dx}{3d^3}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{(a+b\sin^{-1}(cx))^2}{3d^3x^3(1-c^2x^2)^2} - \frac{7c^2(a+b\sin^{-1}(cx))^2}{3d^3x(1-c^2x^2)^2} + \frac{1}{3}(35c^4)\int$$

$$= \frac{b^2c^2}{6d^3x(1-c^2x^2)} + \frac{19bc^3(a+b\sin^{-1}(cx))}{9d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{(a+b\sin^{-1}(c}{3d^3x^3(1-c^2}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{19b^2c^4x}{18d^3(1-c^2x^2)} + \frac{bc^3(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\,\mathrm{s}}{3d^3x^2(1-}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\,\mathrm{s}}{3d^3x^2(1-}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\,\mathrm{s}}{3d^3x^2(1-}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\,\mathrm{s}}{3d^3x^2(1-}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\,\mathrm{s}}{3d^3x^2(1-}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\,\mathrm{s}}{3d^3x^2(1-}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1657 vs. $2(572) = 1144$.
time = 10.18, size = 1657, normalized size = 2.90

Too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/3*a^2/(d^3*x^3) - (3*a^2*c^2)/(d^3*x) + (a^2*c^4*x)/(4*d^3*(-1 + c^2*x^2
)^2) - (11*a^2*c^4*x)/(8*d^3*(-1 + c^2*x^2)) - (35*a^2*c^3*Log[1 - c*x])/(1
6*d^3) + (35*a^2*c^3*Log[1 + c*x])/(16*d^3) - (2*a*b*((c^3*((2 - c*x)*Sqrt[
1 - c^2*x^2] - 3*ArcSin[c*x]))/(48*(-1 + c*x)^2) - (11*c^3*(Sqrt[1 - c^2*x^
2] - ArcSin[c*x]))/(16*(-1 + c*x)) + (11*c^4*(Sqrt[1 - c^2*x^2] + ArcSin[c*
```

```
x]))/(16*(c + c^2*x)) + (c^3*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))
/(48*(1 + c*x)^2) - 3*c^2*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1 - c^2*x^2]])
 + (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^
2]])/(6*x^3) + (35*c^4*((((3*I)/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2
)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi*Log[1 + I*E^(I*ArcSin[c*
x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[Ar
cSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])])/c))/16 - (35*c^4*(((I/2)*Pi*ArcSin[c*x])/c -
((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c + (Pi*Log[
1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/
c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
)/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/16))/d^3 - (b^2*c^3*(((-1
9*I)/3)*PolyLog[2, -E^(I*ArcSin[c*x])] + ((19*I)/3)*PolyLog[2, E^(I*ArcSin[
c*x])] + (68*ArcSin[c*x] + 35*ArcSin[c*x]^3 - 105*ArcSin[c*x]^2*Log[1 - I*E
^(I*ArcSin[c*x])] - 105*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c
*x])))/(2*E^((I/2)*ArcSin[c*x]))] + 105*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin
[c*x])] + 105*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((
I/2)*ArcSin[c*x])] - 105*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*Arc
Sin[c*x])))/E^((I/2)*ArcSin[c*x])] - 105*ArcSin[c*x]^2*Log[((1 + I) + (1 -
I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] + 105*Pi*ArcSin[c*x]*Log[-
Cos[(Pi + 2*ArcSin[c*x])/4]] + 68*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]] - 105*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 68*L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 105*ArcSin[c*x]^2*Log[Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 105*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (210*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (21
0*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + 210*PolyLog[3, (-I)*E^(I
*ArcSin[c*x])] - 210*PolyLog[3, I*E^(I*ArcSin[c*x])])/24 + (24 - 204*c*x*Ar
cSin[c*x] + 204*ArcSin[c*x]^2 - 105*c*x*ArcSin[c*x]^3 + (20 + 658*ArcSin[c*
x]^2)*Cos[2*ArcSin[c*x]] - 4*(6 + 35*ArcSin[c*x]^2)*Cos[4*ArcSin[c*x]] - 20
*Cos[6*ArcSin[c*x]] - 210*ArcSin[c*x]^2*Cos[6*ArcSin[c*x]] - 456*c*x*ArcSin
[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 456*c*x*ArcSin[c*x]*Log[1 + E^(I*ArcSin[
c*x])] + 540*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - 204*ArcSin[c*x]*Sin[3*ArcSin[
c*x]] - 105*ArcSin[c*x]^3*Sin[3*ArcSin[c*x]] - 456*ArcSin[c*x]*Log[1 - E^(I
*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] + 456*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x
])]*Sin[3*ArcSin[c*x]] + 32*ArcSin[c*x]*Sin[4*ArcSin[c*x]] + 68*ArcSin[c*x]
*Sin[5*ArcSin[c*x]] + 35*ArcSin[c*x]^3*Sin[5*ArcSin[c*x]] + 152*ArcSin[c*x]
*Log[1 - E^(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]] - 152*ArcSin[c*x]*Log[1 + E^
(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]] - 116*ArcSin[c*x]*Sin[6*ArcSin[c*x]] +
68*ArcSin[c*x]*Sin[7*ArcSin[c*x]] + 35*ArcSin[c*x]^3*Sin[7*ArcSin[c*x]] + 1
52*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[7*ArcSin[c*x]] - 152*ArcSin[c
*x]*Log[1 + E^(I*ArcSin[c*x])]*Sin[7*ArcSin[c*x]])/(1536*c^3*x^3*(1 - c^2*x
^2)^2)))/d^3
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1290 vs. $2(583) = 1166$.

time = 0.51, size = 1291, normalized size = 2.26

method	result	size
derivativedivides	Expression too large to display	1291
default	Expression too large to display	1291

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-35/8*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^3*x^3-1/3*b^2/d^3/
(c^4*x^4-2*c^2*x^2+1)/c^3/x^3*arcsin(c*x)^2+35/16*a^2/d^3*ln(c*x+1)-1/3*a*b
/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2/x^2*(-c^2*x^2+1)^(1/2)-2/3*a*b/d^3/(c^4*x^4-
2*c^2*x^2+1)/c^3/x^3*arcsin(c*x)-1/3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2/x^2*
arcsin(c*x)*(-c^2*x^2+1)^(1/2)-7/3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/c/x*arcsin
(c*x)^2+175/24*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c*x+29/12*b^2/d^
3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-35/4*a*b/d^3
/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*c^3*x^3+29/12*a*b/d^3/(c^4*x^4-2*c^2*x^2
+1)*c^2*x^2*(-c^2*x^2+1)^(1/2)+175/12*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(
c*x)*c*x-19/3*b^2/d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*a^2/d^3/
c/x+19/3*a*b/d^3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-19/3*a*b/d^3*ln(1+I*c*x+(-c
^2*x^2+1)^(1/2))-14/3*a*b/d^3/(c^4*x^4-2*c^2*x^2+1)/c/x*arcsin(c*x)-9/4*b^2
/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-9/4*a*b/d^3/(c^4*
x^4-2*c^2*x^2+1)*(-c^2*x^2+1)^(1/2)-35/4*a*b/d^3*arcsin(c*x)*ln(1+I*(I*c*x+
(-c^2*x^2+1)^(1/2)))+35/4*a*b/d^3*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))-5/12*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)*c^3*x^3+3/4*b^2/d^3/(c^4*x^4-2*c^2
*x^2+1)*c*x-35/16*a^2/d^3*ln(c*x-1)-1/16*a^2/d^3/(c*x+1)^2-11/16*a^2/d^3/(c
*x+1)+1/16*a^2/d^3/(c*x-1)^2-11/16*a^2/d^3/(c*x-1)+35/4*b^2/d^3*polylog(3,I
*(I*c*x+(-c^2*x^2+1)^(1/2)))-35/4*b^2/d^3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^
(1/2)))-17/3*I*b^2/d^3*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-1/3*a^2/d^3/c^3/x^3
+19/3*I*b^2/d^3*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+19/3*I*b^2/d^3*dilog(1+I*c*
x+(-c^2*x^2+1)^(1/2))-35/4*I*b^2/d^3*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x
^2+1)^(1/2)))+35/4*I*b^2/d^3*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))-1/3*b^2/d^3/(c^4*x^4-2*c^2*x^2+1)/c/x-35/4*I*a*b/d^3*dilog(1-I*(I*c*
x+(-c^2*x^2+1)^(1/2)))+35/4*I*a*b/d^3*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))
+35/8*b^2/d^3*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-35/8*b^2/d^3
*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/48*a^2*(105*c^3*log(c*x + 1)/d^3 - 105*c^3*log(c*x - 1)/d^3 - 2*(105*c^6*
x^6 - 175*c^4*x^4 + 56*c^2*x^2 + 8)/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)
) + 1/48*(105*(b^2*c^7*x^7 - 2*b^2*c^5*x^5 + b^2*c^3*x^3)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 105*(b^2*c^7*x^7 - 2*b^2*c^5*x^5
 + b^2*c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1)
- 2*(105*b^2*c^6*x^6 - 175*b^2*c^4*x^4 + 56*b^2*c^2*x^2 + 8*b^2)*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 48*(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*
x^3)*integrate(-1/24*(48*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (
105*(b^2*c^8*x^8 - 2*b^2*c^6*x^6 + b^2*c^4*x^4)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))*log(c*x + 1) - 105*(b^2*c^8*x^8 - 2*b^2*c^6*x^6 + b^2*c^4*x
^4)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(105*b^2*c
^7*x^7 - 175*b^2*c^5*x^5 + 56*b^2*c^3*x^3 + 8*b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^10 - 3*c^4
*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x))/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3
*x^3)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^10 - 3*c
^4*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx+\int \frac{b^2\operatorname{asin}^2(cx)}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx+\int \frac{2ab\operatorname{asin}(cx)}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x) + Integ
ral(b**2*asin(c*x)**2/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x) +
 Integral(2*a*b*asin(c*x)/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4),
x))/d**3
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))^2}{x^4\,(d - c^2\,d\,x^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^3), x)
```

3.210 $\int x^3 \sqrt{d-c^2dx^2} (a+b\textbf{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=374

$$\frac{52b^2\sqrt{d-c^2dx^2}}{225c^4}+\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{26b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4}-\frac{2b^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4}+\frac{4b^2x\sqrt{d-}}{15c}$$

```
[Out] 52/225*b^2*(-c^2*d*x^2+d)^(1/2)/c^4+26/675*b^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^
(1/2)/c^4-2/125*b^2*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^4-2/15*(a+b*arcsi
n(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4-1/15*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2
+d)^(1/2)/c^2+1/5*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/15*a*b*x*(
-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/15*b^2*x*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+2/45*b*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/25*b*c*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.34, antiderivative size = 374, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {4783, 4795, 4767, 4715, 267, 4723, 272, 45}

$$-\frac{x^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2}{15c^2}-\frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{25\sqrt{1-c^2x^2}}+\frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2+\frac{2bx^3\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{45c\sqrt{1-c^2x^2}}-\frac{2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2}{15c^4}+\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{4b^2x\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}-\frac{2b^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4}+\frac{26b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4}+\frac{52b^2\sqrt{d-c^2dx^2}}{225c^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (52*b^2*Sqrt[d - c^2*d*x^2])/(225*c^4) + (4*a*b*x*Sqrt[d - c^2*d*x^2])/(15*
c^3*Sqrt[1 - c^2*x^2]) + (26*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(675*c^
4) - (2*b^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c^4) + (4*b^2*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(15*c^3*Sqrt[1 - c^2*x^2]) + (2*b*x^3*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^5*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) - (2*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2)/(15*c^2) + (x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/
5
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{5}x^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\sqrt{d-c^2dx^2}\int\frac{x^3(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}}{5\sqrt{1-c^2x^2}}$$

$$=-\frac{2bcx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{25\sqrt{1-c^2x^2}}-\frac{x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}\right.}{15c^2}$$

$$=\frac{2bx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{45c\sqrt{1-c^2x^2}}-\frac{2bcx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-}\right.}{25\sqrt{1-c^2x^2}}$$

$$=\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{2bx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{45c\sqrt{1-c^2x^2}}-\frac{2bcx^5\sqrt{}}{}$$

$$=-\frac{2b^2\sqrt{d-c^2dx^2}}{25c^4}+\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{4b^2(1-c^2x^2)\sqrt{d-c^2dx}}{75c^4}$$

$$=\frac{52b^2\sqrt{d-c^2dx^2}}{225c^4}+\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{26b^2(1-c^2x^2)\sqrt{d-c^2dx}}{675c^4}$$

Mathematica [A]
time = 0.19, size = 242, normalized size = 0.65

$$\frac{\sqrt{d-c^2dx^2}\left(225a^2\sqrt{1-c^2x^2}\left(-2-c^2x^2+3c^4x^4\right)-30abcx\left(-30-5c^2x^2+9c^4x^4\right)-2b^2\sqrt{1-c^2x^2}\left(-428+11c^2x^2+27c^4x^4\right)-30b\left(15a\sqrt{1-c^2x^2}\left(2+c^2x^2-3c^4x^4\right)+bcx\left(-30-5c^2x^2+9c^4x^4\right)\right)\mathrm{ArcSin}(cx)+225b^2\sqrt{1-c^2x^2}\left(-2-c^2x^2+3c^4x^4\right)\mathrm{ArcSin}(cx)^2\right)}{3375c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(225*a^2*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4)
- 30*a*b*c*x*(-30 - 5*c^2*x^2 + 9*c^4*x^4) - 2*b^2*Sqrt[1 - c^2*x^2]*(-428
+ 11*c^2*x^2 + 27*c^4*x^4) - 30*b*(15*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2 - 3*
c^4*x^4) + b*c*x*(-30 - 5*c^2*x^2 + 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*Sqrt[
1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]^2))/(3375*c^4*Sqrt[1 -
c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.40, size = 1165, normalized size = 3.11

method	result
default	$a^2\left(-\frac{x^2(-c^2d\,x^2+d)^{\frac{3}{2}}}{5c^2d}-\frac{2(-c^2d\,x^2+d)^{\frac{3}{2}}}{15d\,c^4}\right)+b^2\left(\frac{\sqrt{-d\,(c^2x^2-1)}\,\left(16c^6x^6-28c^4x^4-16i\sqrt{-c^2x^2+1}\,x^5c^5+1\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2))+b
^2*(1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(
1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(c^2*x^2-1)+1/864*(-d
*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I
*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/(c^2*x^2
-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsi
n(c*x)^2-2+2*I*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^4/(c^
2*x^2-1)+1/864*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4
*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x
)^2-2)/c^4/(c^2*x^2-1)+1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/
2)*x^5*c^5+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*
x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(
c^2*x^2-1))+2*a*b*(1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I
*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x
^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/(c^2*
x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(ar
csin(c*x)-I)/c^4/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)
^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcs
in(c*x))/c^4/(c^2*x^2-1)-1/3600*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2
)*x*c+c^2*x^2-1)*(17*I+15*arcsin(c*x))*cos(4*arcsin(c*x))/c^4/(c^2*x^2-1)-1
/900*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(2*I+15*ar
csin(c*x))*sin(4*arcsin(c*x))/c^4/(c^2*x^2-1))
```

Maxima [A]
time = 0.49, size = 311, normalized size = 0.83

$$-\frac{1}{15}\,b^2\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)\arcsin\left(cx\right)^2-\frac{2}{15}\,ab\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)\arcsin\left(cx\right)-\frac{1}{15}\,a^2\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)-\frac{2}{3375}\,b^2\left(\frac{27\,\sqrt{-c^2x^2+1}\,c^2\sqrt{d}\,x^4+11\,\sqrt{-c^2x^2+1}\,\sqrt{d}\,x^2-\frac{428\,\sqrt{-c^2x^2+1}\,\sqrt{d}}{c^2}}{c^2}+\frac{15\left(9\,c^4\sqrt{d}\,x^5-5\,c^2\sqrt{d}\,x^3-30\,\sqrt{d}\,x\right)\arcsin\left(cx\right)}{c^3}\right)-\frac{2\left(9\,c^4\sqrt{d}\,x^5-5\,c^2\sqrt{d}\,x^3-30\,\sqrt{d}\,x\right)ab}{225\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -1/15*b^2*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/
(c^4*d))*arcsin(c*x)^2 - 2/15*a*b*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2
```

```
*(-c^2*d*x^2 + d)^(3/2)/(c^4*d))*arcsin(c*x) - 1/15*a^2*(3*(-c^2*d*x^2 + d)
^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d)) - 2/3375*b^2*((27*sq
rt(-c^2*x^2 + 1)*c^2*sqrt(d)*x^4 + 11*sqrt(-c^2*x^2 + 1)*sqrt(d)*x^2 - 428*
sqrt(-c^2*x^2 + 1)*sqrt(d)/c^2)/c^2 + 15*(9*c^4*sqrt(d)*x^5 - 5*c^2*sqrt(d)
*x^3 - 30*sqrt(d)*x)*arcsin(c*x)/c^3) - 2/225*(9*c^4*sqrt(d)*x^5 - 5*c^2*sq
rt(d)*x^3 - 30*sqrt(d)*x)*a*b/c^3
```

Fricas [A]
time = 3.39, size = 277, normalized size = 0.74

$$\frac{30\,(9\,abc^5x^5 - 5\,abc^3x^3 - 30\,abcx + (9\,b^2c^5x^5 - 5\,b^2c^3x^3 - 30\,b^2cx)\arcsin(cx))\sqrt{-c^2dx^2 + d}\,\sqrt{-c^2x^2 + 1} + (27\,(25\,a^2 - 2\,b^2)c^6x^6 - 4\,(225\,a^2 - 8\,b^2)c^4x^4 - (225\,a^2 - 878\,b^2)c^2x^2 + 225\,(3\,b^2c^6x^6 - 4\,b^2c^4x^4 - b^2c^2x^2 + 2\,b^2)\arcsin(cx)^2 + 450\,a^2 - 856\,b^2 + 450\,(3\,abc^6x^6 - 4\,abc^4x^4 - abc^2x^2 + 2\,ab)\arcsin(cx))\sqrt{-c^2dx^2 + d}}{3375\,(c^6x^2 - c^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] 1/3375*(30*(9*a*b*c^5*x^5 - 5*a*b*c^3*x^3 - 30*a*b*c*x + (9*b^2*c^5*x^5 - 5
*b^2*c^3*x^3 - 30*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2
+ 1) + (27*(25*a^2 - 2*b^2)*c^6*x^6 - 4*(225*a^2 - 8*b^2)*c^4*x^4 - (225*a^
2 - 878*b^2)*c^2*x^2 + 225*(3*b^2*c^6*x^6 - 4*b^2*c^4*x^4 - b^2*c^2*x^2 + 2
*b^2)*arcsin(c*x)^2 + 450*a^2 - 856*b^2 + 450*(3*a*b*c^6*x^6 - 4*a*b*c^4*x^
4 - a*b*c^2*x^2 + 2*a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^3\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\operatorname{asin}(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 \left(a+b\,\mathrm{asin}(c\,x)\right)^2 \sqrt{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.211 $\int x^2 \sqrt{d-c^2 d x^2} (a+b\text{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=303

$$\frac{b^2 x \sqrt{d-c^2 d x^2}}{64 c^2}-\frac{1}{32} b^2 x^3 \sqrt{d-c^2 d x^2}-\frac{b^2 \sqrt{d-c^2 d x^2}\, \text{ArcSin}(cx)}{64 c^3 \sqrt{1-c^2 x^2}}+\frac{b x^2 \sqrt{d-c^2 d x^2}\, (a+b\text{ArcSin}(cx))}{8 c \sqrt{1-c^2 x^2}}-\frac{b c x^4}{}$$

```
[Out] 1/64*b^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-1/32*b^2*x^3*(-c^2*d*x^2+d)^(1/2)-1/8*x
*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*x^3*(-c^2*d*x^2+d)^(1/2)*
(a+b*arcsin(c*x))^2-1/64*b^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2
+1)^(1/2)+1/8*b*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(
1/2)-1/8*b*c*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+
1/24*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.26, antiderivative size = 303, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used = {4783, 4795, 4737, 4723, 327, 222}

$$\frac{b x^2 \sqrt{d-c^2 d x^2}\, (a+b\text{ArcSin}(cx))}{8 c \sqrt{1-c^2 x^2}}-\frac{x \sqrt{d-c^2 d x^2}\, (a+b\text{ArcSin}(cx))^2}{8 c^2}-\frac{b c x^4 \sqrt{d-c^2 d x^2}\, (a+b\text{ArcSin}(cx))}{8 \sqrt{1-c^2 x^2}}+\frac{1}{4} x^3 \sqrt{d-c^2 d x^2}\, (a+b\text{ArcSin}(cx))^2+\frac{\sqrt{d-c^2 d x^2}\, (a+b\text{ArcSin}(cx))^3}{24 b c^3 \sqrt{1-c^2 x^2}}-\frac{b^2 \text{ArcSin}(cx) \sqrt{d-c^2 d x^2}}{64 c^3 \sqrt{1-c^2 x^2}}+\frac{b^2 x \sqrt{d-c^2 d x^2}}{64 c^2}-\frac{1}{32} b^2 x^3 \sqrt{d-c^2 d x^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (b^2*x*Sqrt[d - c^2*d*x^2])/(64*c^2) - (b^2*x^3*Sqrt[d - c^2*d*x^2])/32 - (
b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/4 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(24*b*c^3
*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{4}x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\sqrt{d-c^2dx^2}\int\frac{x^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^4\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c\right.}{8c^2}$$

$$= -\frac{1}{32}b^2x^3\sqrt{d-c^2dx^2} + \frac{bx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c\sqrt{1-c^2x^2}} - \frac{bcx^4\sqrt{}}{}$$

$$= \frac{b^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{1}{32}b^2x^3\sqrt{d-c^2dx^2} + \frac{bx^2\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{8c\sqrt{1-c^2x^2}}$$

$$= \frac{b^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{1}{32}b^2x^3\sqrt{d-c^2dx^2} - \frac{b^2\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{64c^3\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.22, size = 246, normalized size = 0.81

$$\frac{\sqrt{d-c^2dx^2}\left(8a^3+3b^3cx(1-2c^2x^2)\sqrt{1-c^2x^2}-24ab^2c^2x^2(-1+c^2x^2)+24a^2bcx\sqrt{1-c^2x^2}(-1+2c^2x^2)-3b\left(-8a^2+16abcx(1-2c^2x^2)\sqrt{1-c^2x^2}+b^2(1-8c^2x^2+8c^4x^4)\right)\mathrm{ArcSin}(cx)+24b^2\left(a+bcx\sqrt{1-c^2x^2}(-1+2c^2x^2)\right)\mathrm{ArcSin}(cx)^2+8b^3\mathrm{ArcSin}(cx)^3\right)}{192bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(8*a^3 + 3*b^3*c*x*(1 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] -
 24*a*b^2*c^2*x^2*(-1 + c^2*x^2) + 24*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c
^2*x^2) - 3*b*(-8*a^2 + 16*a*b*c*x*(1 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + b^2*
(1 - 8*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + 24*b^2*(a + b*c*x*Sqrt[1 - c^2*x
^2]*(-1 + 2*c^2*x^2))*ArcSin[c*x]^2 + 8*b^3*ArcSin[c*x]^3))/(192*b*c^3*Sqrt
[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.44, size = 678, normalized size = 2.24

method	result
default	$-\frac{a^2x(-c^2dx^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{a^2x\sqrt{-c^2dx^2+d}}{8c^2}+\frac{a^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8c^2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c}}{24c^3(c^2x^2-}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a^2*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/8*a^2/c^2*x*(-c^2*d*x^2+d)^(1/2)+1/
8*a^2/c^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*
(-1/24*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x
)^3+1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5
+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I
*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/512*(-d*(c^2*x^2-1))^(1/2
)*(8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-
12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*(-4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)
/c^3/(c^2*x^2-1))+2*a*b*(-1/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^
3/(c^2*x^2-1)*arcsin(c*x)^2+1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)
^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*
x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1)
)^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^
2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*(-I+4*arcsin(c*x))/c^3/(c^2*x^
2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] 1/8*a^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) +
sqrt(d)*arcsin(c*x)/c^3) + sqrt(d)*integrate((b^2*x^2*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c^
2*d*x^2 + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^2\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\operatorname{asin}{(cx)})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d-c^2\,d\,x^2}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.212 $\int x\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=188

$$\frac{4b^2\sqrt{d-c^2dx^2}}{9c^2}+\frac{2b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{2bx\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}\,(a+b}{9\sqrt{1-c^2x^2}}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/c^2/d+4/9*b^2*(-c^2*d*x^2+d)^
(1/2)/c^2+2/27*b^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+2/3*b*x*(a+b*arcsi
n(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/9*b*c*x^3*(a+b*arcsin(c
*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4767, 4739, 455, 45}

$$\frac{2bx\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{3c\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2}{3c^2d}-\frac{2bcx^3\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}+\frac{2b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{4b^2\sqrt{d-c^2dx^2}}{9c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d - c^2*d*x^2])/(9*c^2) + (2*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x
^2])/(27*c^2) + (2*b*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1
 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[
1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
```

```
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = -\frac{(d-c^2dx^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c^2d}+\frac{\left(2b\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2}{3c\sqrt{1-c^2}}$$

$$=\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.}{9\sqrt{1-c^2x^2}}$$

$$=\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.}{9\sqrt{1-c^2x^2}}$$

$$=\frac{2bx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(\right.}{9\sqrt{1-c^2x^2}}$$

$$=\frac{4b^2\sqrt{d-c^2dx^2}}{9c^2}+\frac{2b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{2bx\sqrt{d-c^2dx^2}\,(a}{3c\sqrt{1-}}$$

Mathematica [A]
time = 0.18, size = 120, normalized size = 0.64

$$\frac{\sqrt{d-c^2dx^2}\left((-1+c^2x^2)\,(a+b\text{ArcSin}(cx))^2-\frac{2b\left(b\sqrt{1-c^2x^2}\,(-7+c^2x^2)+3acx(-3+c^2x^2)+3bcx(-3+c^2x^2)\text{ArcSin}(cx)\right)}{9\sqrt{1-c^2x^2}}\right)}{3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*((-1 + c^2*x^2)*(a + b*ArcSin[c*x])^2 - (2*b*(b*Sqrt[1
 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 + c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2
)*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2])))/(3*c^2)
```

Maple [C] Result contains complex when optimal does not.
time = 0.21, size = 700, normalized size = 3.72

method	result
default	$-\frac{a^2(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(4c^4x^4-5c^2x^2-4i\sqrt{-c^2x^2+1}\,x^3c^3+3i\sqrt{-c^2x^2+1}\,xc+1\right)(6i\,\text{arc}}{216c^2(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a^2/c^2/d*(-c^2*d*x^2+d)^(3/2)+b^2*(1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^
4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1
)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x)
)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*
x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^2/(c^2*x^2-1)+1/216*(-d*(c^2*x^2
-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)
*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1))+2*a
*b*(1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)
*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)-1/
8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+
I)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2
*x^2-1)*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*
(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))
```

Maxima [A]
time = 0.52, size = 188, normalized size = 1.00

$$-\frac{2}{27}\,b^2\left(\frac{\sqrt{-c^2x^2+1}\,d^{\frac{3}{2}}x^2-\frac{7\sqrt{-c^2x^2+1}\,d^{\frac{3}{2}}}{c^2}}{d}+\frac{3\left(c^2d^{\frac{3}{2}}x^3-3\,d^{\frac{3}{2}}x\right)\arcsin(cx)}{cd}\right)-\frac{(-c^2dx^2+d)^{\frac{3}{2}}b^2\arcsin(cx)^2}{3\,c^2d}-\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}ab\arcsin(cx)}{3\,c^2d}-\frac{2\left(c^2d^{\frac{3}{2}}x^3-3\,d^{\frac{3}{2}}x\right)ab}{9\,cd}-\frac{(-c^2dx^2+d)^{\frac{3}{2}}a^2}{3\,c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -2/27*b^2*((sqrt(-c^2*x^2 + 1)*d^(3/2)*x^2 - 7*sqrt(-c^2*x^2 + 1)*d^(3/2)/c
^2)/d + 3*(c^2*d^(3/2)*x^3 - 3*d^(3/2)*x)*arcsin(c*x)/(c*d)) - 1/3*(-c^2*d*
x^2 + d)^(3/2)*b^2*arcsin(c*x)^2/(c^2*d) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a*b*a
rcsin(c*x)/(c^2*d) - 2/9*(c^2*d^(3/2)*x^3 - 3*d^(3/2)*x)*a*b/(c*d) - 1/3*(-
c^2*d*x^2 + d)^(3/2)*a^2/(c^2*d)
```

Fricas [A]
time = 3.41, size = 208, normalized size = 1.11

$$\frac{6\,(abc^3x^3-3\,abcx+(b^2c^3x^3-3\,b^2cx)\arcsin(cx))\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+((9\,a^2-2\,b^2)c^4x^4-2\,(9\,a^2-8\,b^2)c^2x^2+9\,(b^2c^4x^4-2\,b^2c^2x^2+b^2)\arcsin(cx)^2+9\,a^2-14\,b^2+18\,(abc^4x^4-2\,abc^2x^2+ab)\arcsin(cx))\sqrt{-c^2dx^2+d}}{27\,(c^4x^2-c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27*(6*(a*b*c^3*x^3 - 3*a*b*c*x + (b^2*c^3*x^3 - 3*b^2*c*x)*arcsin(c*x))*s
qrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + ((9*a^2 - 2*b^2)*c^4*x^4 - 2*(9*a^
2 - 8*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 +
9*a^2 - 14*b^2 + 18*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 + a*b)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d-c^2\,d\,x^2}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.213 $\int \sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=192

$$-\frac{1}{4}b^2x\sqrt{d-c^2dx^2}+\frac{b^2\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)}{4c\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\,(a+b$$

```
[Out] -1/4*b^2*x*(-c^2*d*x^2+d)^(1/2)+1/2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)
)^2+1/4*b^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*x
^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*(a+b*arcsi
n(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.09, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {4741, 4737, 4723, 327, 222}

$$\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2-\frac{bcx^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}+\frac{b^2\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{4c\sqrt{1-c^2x^2}}-\frac{1}{4}b^2x\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*(b^2*x*Sqrt[d - c^2*d*x^2]) + (b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4
*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(
2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 + (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\sqrt{d-c^2dx^2}\int\frac{(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(c$$

$$= -\frac{1}{4}b^2x\sqrt{d-c^2dx^2}-\frac{bcx^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-$$

$$= -\frac{1}{4}b^2x\sqrt{d-c^2dx^2}+\frac{b^2\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{4c\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d-c^2dx^2}\,(}{2\sqrt{1-}$$

Mathematica [A]
time = 0.14, size = 128, normalized size = 0.67

$$\frac{1}{6}\sqrt{d-c^2dx^2}\left(3x(a+b\text{ArcSin}(cx))^2+\frac{(a+b\text{ArcSin}(cx))^3}{bc\sqrt{1-c^2x^2}}-\frac{3b\left(cx\left(2acx+b\sqrt{1-c^2x^2}\right)+b(-1+2c^2x^2)\,\text{ArcSin}(cx)\right)}{2c\sqrt{1-c^2x^2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(3*x*(a + b*ArcSin[c*x])^2 + (a + b*ArcSin[c*x])^3/(b*
c*Sqrt[1 - c^2*x^2]) - (3*b*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 +
2*c^2*x^2)*ArcSin[c*x]))/(2*c*Sqrt[1 - c^2*x^2])))/6
```

Maple [C] Result contains complex when optimal does not.
time = 0.14, size = 531, normalized size = 2.77

method	result
default	$\frac{x\sqrt{-c^2d\,x^2+d}\;a^2}{2}+\frac{a^2d\arctan\left(\frac{\sqrt{c^2d}\;x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d\left(c^2x^2-1\right)}\;\sqrt{-c^2x^2+1}\;\arcsin(cx)^3}{6c(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*x*(-c^2*d*x^2+d)^(1/2)*a^2+1/2*a^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/c/(c^2*x^2-1)*arcsin(c*x)^3+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1
)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*I*arcsin(c*x)+2*ar
csin(c*x)^2-1)/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^
(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x)+2*arc
sin(c*x)^2-1)/c/(c^2*x^2-1))+2*a*b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2
*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x
))/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^
2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))/c/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2 + sqrt(d)*integrat
e((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d-c^2\,d\,x^2}\,\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.214 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=378

$$-2b^2\sqrt{d-c^2dx^2}-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2-\frac{2\sqrt{}}{}$$

```
[Out] -2*b^2*(-c^2*d*x^2+d)^(1/2)+(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2-2*a*b*
c*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*c*x*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^
2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*I*b*(a+b*arcsin(c*x))
*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.24, antiderivative size = 378, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {4783, 4803, 4268, 2611, 2320, 6724, 4715, 267}

$$\frac{2ib\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(-e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2ib\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2-\frac{2\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_3\left(-e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{2b^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_3\left(e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\mathrm{ArcSin}(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-2b^2\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -2*b^2*Sqrt[d - c^2*d*x^2] - (2*a*b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x
^2] - (2*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] - ((2*I)*b*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*Ar
cSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3,
E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\sqrt{d-c^2dx^2}\int\frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}-$$

$$=-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{\sqrt{d-c^2d}}{}$$

$$=-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}$$

$$=-2b^2\sqrt{d-c^2dx^2}-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(}{\sqrt{1-c^2x^2}}$$

$$=-2b^2\sqrt{d-c^2dx^2}-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(}{\sqrt{1-c^2x^2}}$$

$$=-2b^2\sqrt{d-c^2dx^2}-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\sqrt{d-c^2dx^2}\sin^{-1}(}{\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.75, size = 391, normalized size = 1.03

$$a^2\sqrt{d-c^2dx^2}+a^2\sqrt{d}\log(cx)-a^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{2ab\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)+i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}+\frac{b^2\sqrt{d-c^2dx^2}\left(-2\sqrt{1-c^2x^2}-2cx\text{ArcSin}(cx)+\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2+\text{ArcSin}(cx)^2\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\text{ArcSin}(cx)^2\log\left(1+e^{i\text{ArcSin}(cx)}\right)+2i\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-2i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)-2\text{PolyLog}\left(3,-e^{i\text{ArcSin}(cx)}\right)+2\text{PolyLog}\left(3,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] a^2*Sqrt[d - c^2*d*x^2] + a^2*Sqrt[d]*Log[c*x] - a^2*Sqrt[d]*Log[d + Sqrt[d
]*Sqrt[d - c^2*d*x^2]] + (2*a*b*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*
x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log
[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E
^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (b^2*Sqrt[d - c^2*d*x^2]*(-2*Sqrt[1
 - c^2*x^2] - 2*c*x*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + ArcSin[
c*x]^2*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])
] + (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*Po
lyLog[2, E^(I*ArcSin[c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[
3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1016 vs. $2(384) = 768$.
time = 0.26, size = 1017, normalized size = 2.69

method	result
default	$-\sqrt{d}\ \ln\left(\frac{2d+2\sqrt{d}\ \sqrt{-c^2 d\, x^2+d}}{x}\right) a^2+\sqrt{-c^2 d\, x^2+d}\ a^2+\frac{b^2\sqrt{-d\,(c^2x^2-1)}\ \arcsin(cx)^2 x^2 c^2}{c^2x^2-1}+$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)*a^2+(-c^2*d*x^2+d)^(1/2
)*a^2+b^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*x^2*c^2+2*b^2*(-
d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x*c-2*b^2*(
-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*x^2*c^2-b^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x
^2-1)*arcsin(c*x)^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)+b^2*(-d*(c^2*x
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arc
sin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)
)-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*polylog(2,-
I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+2*a*b*
(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2+2*a*b*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c-2*a*b*(-d*(c^2*x^2-1))^(1/2)/(c
^2*x^2-1)*arcsin(c*x)+2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*
x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(-c^2*x^2+1)^(1/2)*
(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x
)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)/(c^2*x^2-1)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -(sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - sqrt(-c
^2*d*x^2 + d))*a^2 + sqrt(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x
+ 1)*sqrt(-c*x + 1)/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d-c^2\,d\,x^2}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x, x)
```

3.215 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=227

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{x}-\frac{ic\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^3}{3b\sqrt{1-c^2x^2}}+\frac{2\ldots}{}$$

```
[Out] -(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x-I*c*(a+b*arcsin(c*x))^2*(-c^2*d
*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/3*c*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(
1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^
(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*polylog(2,(I*c*x+
(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.241$, Rules used = {4781, 4721, 3798, 2221, 2317, 2438, 4737}

$$-\frac{c\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^3}{3b\sqrt{1-c^2x^2}}-\frac{ic\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{x}+\frac{2bc\sqrt{d-c^2dx^2}\,\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{ib^2c\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) + (2*b*c*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*S
qrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x^2}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x} + \frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x}\,d}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{c\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^3}{3b\sqrt{1-c^2x^2}} +$$

$$= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.67, size = 257, normalized size = 1.13

$$-\frac{a^2\sqrt{d-c^2dx^2}}{x}+a^2c\sqrt{d}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)-\frac{ab\sqrt{d-c^2dx^2}\left(2\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)+cx\mathrm{ArcSin}(cx)^2-2cx\log(cx)\right)}{x\sqrt{1-c^2x^2}}-\frac{b^2c\sqrt{d-c^2dx^2}\left(\mathrm{ArcSin}(cx)\left(\left(3i+\frac{3\sqrt{1-c^2x^2}}{cx}\right)\mathrm{ArcSin}(cx)+\mathrm{ArcSin}(cx)^2-6\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)\right)+3i\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)}{3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((a^2*Sqrt[d - c^2*d*x^2])/x) + a^2*c*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x
^2])/(Sqrt[d]*(-1 + c^2*x^2))] - (a*b*Sqrt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + c*x*ArcSin[c*x]^2 - 2*c*x*Log[c*x]))/(x*Sqrt[1 - c^2*x^2]
) - (b^2*c*Sqrt[d - c^2*d*x^2]*(ArcSin[c*x]*((3*I + (3*Sqrt[1 - c^2*x^2])/(
c*x))*ArcSin[c*x] + ArcSin[c*x]^2 - 6*Log[1 - E^((2*I)*ArcSin[c*x])]) + (3*
I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(3*Sqrt[1 - c^2*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 761 vs. 2(225) = 450.
time = 0.32, size = 762, normalized size = 3.36

method	result
default	$-\frac{a^2(-c^2dx^2+d)^{\frac{3}{2}}}{dx}-a^2c^2x\sqrt{-c^2dx^2+d}-\frac{a^2c^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{\sqrt{c^2d}}+\frac{b^2\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2}}{3c^2x^2-3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d/x*(-c^2*d*x^2+d)^(3/2)-a^2*c^2*x*(-c^2*d*x^2+d)^(1/2)-a^2*c^2*d/(c^2
*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/3*b^2*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*c+2*I*b^2*(-c^2*x^2
+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*c*polylog(2,-I*c*x-(-c^2*x^2+1
)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)*x*c^2+b^2*(-d
*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/x-2*b^2*(-c^2*x^2+1)^(1/2)*(-
d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*c*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2
))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*c*arcsin(c*x
)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2
/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c+a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)/(c^2*x^2-1)*c*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(-d*(c^2*x
^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)*x*c^2+2*a*b*(-d*(c^2*x^2-1))^(1/2)*arc
sin(c*x)/(c^2*x^2-1)/x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2
*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] -(c*sqrt(d)*arcsin(c*x) + sqrt(-c^2*d*x^2 + d)/x)*a^2 + sqrt(d)*integrate((
b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^2, x)
```

3.216 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=398

$$-\frac{bc\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2\,\text{ta}}{\sqrt{1-c^2x^2}}$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2-b*c*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+c^2*(a+b*arcsin(c*x))^2*arctanh(I*c*
x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b^2*c^2*arcta
nh((-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*c^2*(a+b
*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)+I*b*c^2*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+b^2*c^2*polylog(3,-I*c*x-(-c^2*x
^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b^2*c^2*polylog(3,I*c*
x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.26, antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {4781, 4723, 272, 65, 214, 4803, 4268, 2611, 2320, 6724}

$$-\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{bc\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+\frac{b^2c^2\sqrt{d-c^2dx^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{b^2c^2\sqrt{d-c^2dx^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{b^2c^2\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^
2*c^2*Sqrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - (
I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] + (I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (b^2*c^2*Sqrt[d - c^2*d*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*Sqrt[d - c
^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
```

```
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{x^3}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2} + \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x^2}}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^2}{2x^2}$$

Mathematica [A]
time = 3.17, size = 480, normalized size = 1.21

$$\frac{1}{8}\left(-\frac{4a^2\sqrt{d-c^2dx^2}}{x^2}-4a^2c^2\sqrt{d}\log(x)+4a^2c^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{2abc^2d\sqrt{1-c^2x^2}\left(-2\cot\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\text{ArcSin}(cx)\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)-4\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)+4\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)-4i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)+4i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)-2\tan\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{d-c^2dx^2}}+\frac{b^2c^2d\sqrt{1-c^2x^2}\left(-4\text{ArcSin}(cx)\cot\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\text{ArcSin}(cx)^2\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)-4\text{ArcSin}(cx)^2\log\left(1-e^{i\text{ArcSin}(cx)}\right)+4\text{ArcSin}(cx)^2\log\left(1+e^{i\text{ArcSin}(cx)}\right)+8\log\left(\tan\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-8i\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)+8i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)+8\text{PolyLog}\left(3,-e^{i\text{ArcSin}(cx)}\right)-8\text{PolyLog}\left(3,e^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)^2\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)\right)-4\text{ArcSin}(cx)\tan\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{d-c^2dx^2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] ((-4*a^2*Sqrt[d - c^2*d*x^2])/x^2 - 4*a^2*c^2*Sqrt[d]*Log[x] + 4*a^2*c^2*Sq
rt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*c^2*d*Sqrt[1 - c^2*x^2]
*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*
Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*
I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + A
rcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2
] + (b^2*c^2*d*Sqrt[1 - c^2*x^2]*(-4*ArcSin[c*x]*Cot[ArcSin[c*x]/2] - ArcSi
n[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]^2*Log[1 - E^(I*ArcSin[c*x])]
+ 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[ArcSin[c*x]/2]] -
(8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (8*I)*ArcSin[c*x]*PolyLo
g[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(I*ArcSin[c*x])] - 8*PolyLog[3, E
^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Tan[
ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2])/8
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1081 vs. $2(402) = 804$.
time = 0.35, size = 1082, normalized size = 2.72

method	result
default	$-\frac{a^{2}\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{2 d\,x^{2}}+\frac{a^{2} \sqrt{d}\,\ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right) c^{2}}{2}-\frac{a^{2} \sqrt{-c^{2} d\,x^{2}+d}\,c^{2}}{2}-\frac{b^{2} \arcsin\left(c x\right)^{2} \sqrt{-d\left(c^{2}\right.}}{2\left(c^{2} x^{2}-1\right)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2/d/x^2*(-c^2*d*x^2+d)^(3/2)+1/2*a^2*d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2
*d*x^2+d)^(1/2))/x)*c^2-1/2*a^2*(-c^2*d*x^2+d)^(1/2)*c^2-1/2*b^2*arcsin(c*x
)^2*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*c^2+b^2*arcsin(c*x)*(-d*(c^2*x^2-1))
^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+1/2*b^2*arcsin(c*x)^2*(-d*(c^2*x^
2-1))^(1/2)/x^2/(c^2*x^2-1)-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)*c^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/2*b^2*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1-I
*c*x-(-c^2*x^2+1)^(1/2))+I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^
2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*b^2*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I
*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/
(c^2*x^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+b^2*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)*c^2/(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*b
^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2/(c^2*x^2-1)*arctanh(I*c*x+
(-c^2*x^2+1)^(1/2))-a*b*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c^2+
a*b*(-d*(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+a*b*arcsin(c*
```

```
x)*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)-2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2
*x^2-1))^(1/2)*c^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
+2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/(2*c^2*x^2-2)*arcsin(c
*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-
1))^(1/2)*c^2/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*a*b*(-c
^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/(2*c^2*x^2-2)*polylog(2,-I*c*x-(
-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
```

```
[Out] 1/2*(c^2*sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) -
sqrt(-c^2*d*x^2 + d)*c^2 - (-c^2*d*x^2 + d)^(3/2)/(d*x^2))*a^2 + sqrt(d)*in
tegrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**3, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^3, x)
```

3.217 $\int \frac{\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=314

$$-\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x}-\frac{b^2c^3\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)}{3\sqrt{1-c^2x^2}}-\frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3x^2}+\frac{ic^3\sqrt{d-c}}{}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/d/x^3-1/3*b^2*c^2*(-c^2*d*x^2
+d)^(1/2)/x-1/3*b^2*c^3*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
+1/3*I*c^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/3*
b*c^3*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)+1/3*I*b^2*c^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^
2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/3*b*c*(a+b*arcsin(c*x))*(-c^2*
x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/x^2
```

Rubi [A]

time = 0.19, antiderivative size = 314, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4771, 4775, 283, 222, 4721, 3798, 2221, 2317, 2438}

$$-\frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{3x^2}-\frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{3dx^3}+\frac{ic^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3\sqrt{1-c^2x^2}}-\frac{2bc^3\sqrt{d-c^2dx^2}\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{ib^2c^3\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{3\sqrt{1-c^2x^2}}-\frac{b^2c^3\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}-\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*Sqrt[d - c^2*d*x^2])/x - (b^2*c^3*Sqrt[d - c^2*d*x^2]*ArcSin[
c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x]))/(3*x^2) + ((I/3)*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^2)/Sqrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(
3*d*x^3) - (2*b*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I
)*ArcSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + ((I/3)*b^2*c^3*Sqrt[d - c^2*d*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{x^4}\,dx = -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{3dx^3} + \frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)\,(a}{}}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3x^2} - \frac{(d-c^2dx^2)^{3/2}\,(a+}{3dx^3}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{bc\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3x^2} -$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\,\sqrt{}}{}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\,\sqrt{}}{}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\,\sqrt{}}{}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\,\sqrt{}}{}$$

Mathematica [A]
time = 0.84, size = 248, normalized size = 0.79

$$\frac{\sqrt{d-c^2dx^2}\left(2b^2\left(ic^3x^3-\sqrt{1-c^2x^2}+c^2x^2\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)^2-b\text{ArcSin}(cx)\left(2bcx+3a\sqrt{1-c^2x^2}+a\cos(3\text{ArcSin}(cx))+4bc^3x^3\log\left(1-e^{2i\text{ArcSin}(cx)}\right)\right)-2\left(abcx+b^2c^2x^2\sqrt{1-c^2x^2}+a^2(1-c^2x^2)^{3/2}+2abc^3x^3\log(cx)\right)+2ib^2c^3x^3\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)}{6x^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(2*b^2*(I*c^3*x^3 - Sqrt[1 - c^2*x^2] + c^2*x^2*Sqrt[1
 - c^2*x^2])*ArcSin[c*x]^2 - b*ArcSin[c*x]*(2*b*c*x + 3*a*Sqrt[1 - c^2*x^2]
 + a*Cos[3*ArcSin[c*x]] + 4*b*c^3*x^3*Log[1 - E^((2*I)*ArcSin[c*x])]) - 2*(
a*b*c*x + b^2*c^2*x^2*Sqrt[1 - c^2*x^2] + a^2*(1 - c^2*x^2)^(3/2) + 2*a*b*c
^3*x^3*Log[c*x]) + (2*I)*b^2*c^3*x^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(6
*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3016 vs. 2(294) = 588.
time = 0.45, size = 3017, normalized size = 9.61

method	result	size
default	Expression too large to display	3017

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] 2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c^7-2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*
c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5-b^2*(-d*(c^2*
x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*c^3+b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1
)*arcsin(c*x)^2*c^8-3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^
3/(c^2*x^2-1)*arcsin(c*x)^2*c^6+10/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-
3*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)^2*c^4-5/3*b^2*(-d*(c^2*x^2-1))^(1/2)
/(3*c^4*x^4-3*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2+2*b^2*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*c*x+(-c^
2*x^2+1)^(1/2))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3/(3*c^2*
x^2-3)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/3*b^2*(-d*(c^2*x^2-1))^
(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-1/3*I*b^2*(-
d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
*c^3-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3/(3*c^2*x^2-3)*ar
csin(c*x)^2-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3/(3*c^2*x^
2-3)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c
^2*x^2-1))^(1/2)*c^3/(3*c^2*x^2-3)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/3*
a^2/d/x^3*(-c^2*d*x^2+d)^(3/2)-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*
c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*
c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*
c^2*x^2+1)*x/(c^2*x^2-1)*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^
2*x^2+1)/x/(c^2*x^2-1)*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*
x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)^2-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^
4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+2/3*I*a*b*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)*c^3+1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1
)*(-c^2*x^2+1)*c^4-a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)*c^3+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c
^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^3+20/3*a*b*(-
d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-
1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*c^4-
10/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x/(c^2*x^2-1)*arcsi
n(c*x)*c^2+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^2/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)*c+2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c
^2*x^2+1)*x^3/(c^2*x^2-1)*c^6+2*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2
```

```
*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3
*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8-6*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c
^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6-4*I*a*b*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*c^3/(3*c^2*x^2-3)+a*b*(-d*(c^2*x^2-1
))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5-1/3
*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsi
n(c*x)*(-c^2*x^2+1)*c^6-I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1
)*x^2/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5+1/3*I*b^2*(-d*(c^2*x
^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)
*c^4+I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^4/(c^2*x^2-1)*a
rcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^7+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x
^4-3*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+2/3*I*b^2*
(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*
c^6+b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c^5+I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^
2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5-1/3*I*b^2*(-d*(c^2*x^2-1))^
(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4+1/3*I*b^2*(-d*(
c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x
^2+1)^(1/2)*c^3-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^
5/(c^2*x^2-1)*arcsin(c*x)*c^8-I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2
*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] 1/3*((-1)^(-2*c^2*d*x^2 + 2*d)*c^2*d^(3/2)*log(-2*c^2*d + 2*d/x^2) + c^2*d^
(3/2)*log(x^2 - 1/c^2) - sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*d/x^2)*a*b*c/d -
 2/3*(-c^2*d*x^2 + d)^(3/2)*a*b*arcsin(c*x)/(d*x^3) + 1/3*((c^2*x^2 - 1)*sq
rt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))^2 - sqrt(d)*x^3*integrate(2*(c^3*x^2 - c)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))/x^3, x))*b^2/x^3 - 1/3*(-c^2*d*x^2 + d)^(3/2)*a^2/(d*x^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^4, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\,\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**4,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**4, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d-c^2\,d\,x^2}}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^4,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^4, x)
```

3.218 $\int x^3(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=503

$$\frac{304b^2d\sqrt{d-c^2dx^2}}{3675c^4}+\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{152b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{11025c^4}+\frac{38b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4}-$$

```
[Out] 1/7*x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+304/3675*b^2*d*(-c^2*d*x^2
+d)^(1/2)/c^4+152/11025*b^2*d*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^4+38/6125
*b^2*d*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^4-2/343*b^2*d*(-c^2*x^2+1)^3*(
-c^2*d*x^2+d)^(1/2)/c^4-2/35*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4
-1/35*d*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+3/35*d*x^4*(a+b*ar
csin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/35*a*b*d*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c
^2*x^2+1)^(1/2)+4/35*b^2*d*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2
+1)^(1/2)+2/105*b*d*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+
1)^(1/2)-16/175*b*c*d*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)+2/49*b*c^3*d*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)
```

Rubi [A]

time = 0.56, antiderivative size = 503, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 14, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.483, Rules used = {4787, 4783, 4795, 4767, 4715, 267, 4723, 272, 45, 14, 4777, 12, 457, 78}

$$-\frac{dx^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2}{35c^2}-\frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{175\sqrt{1-c^2x^2}}+\frac{1}{7}x^4(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2+\frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2+\frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{105c\sqrt{1-c^2x^2}}-\frac{2d\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2}{35c^4}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{49\sqrt{1-c^2x^2}}+\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{4b^2dx\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}-\frac{2b^2d(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^4}+\frac{38b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4}+\frac{304b^2d\sqrt{d-c^2dx^2}}{3675c^4}+\frac{152b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{11025c^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (304*b^2*d*Sqrt[d - c^2*d*x^2])/(3675*c^4) + (4*a*b*d*x*Sqrt[d - c^2*d*x^2]
)/(35*c^3*Sqrt[1 - c^2*x^2]) + (152*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]
)/(11025*c^4) + (38*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(6125*c^4) -
 (2*b^2*d*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^4) + (4*b^2*d*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(35*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(105*c*Sqrt[1 - c^2*x^2]) - (16*b*c*d*x^5
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(175*Sqrt[1 - c^2*x^2]) + (2*b*c^
3*d*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(49*Sqrt[1 - c^2*x^2]) - (
2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^4) - (d*x^2*Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^2) + (3*d*x^4*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])^2)/35 + (x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
```

```
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{7}(3d)\int x^3\sqrt{d-c^2dx^2}$$

$$=-\frac{2bcdx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{35\sqrt{1-c^2x^2}}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}\,(a}{49\sqrt{1-c^2}}$$

$$=-\frac{16bcdx^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{175\sqrt{1-c^2x^2}}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}\,(}{49\sqrt{1-c}}$$

$$=\frac{2bdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{105c\sqrt{1-c^2x^2}}-\frac{16bcdx^5\sqrt{d-c^2dx^2}\,(a+}{175\sqrt{1-c^2x^2}}$$

$$=\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{2bdx^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{105c\sqrt{1-c^2x^2}}-\frac{16b}{}$$

$$=-\frac{62b^2d\sqrt{d-c^2dx^2}}{1225c^4}+\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{74b^2d(1-c^2x^2)\,\sqrt{}}{3675c^4}$$

$$=\frac{304b^2d\sqrt{d-c^2dx^2}}{3675c^4}+\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{152b^2d(1-c^2x^2)\,\sqrt{}}{11025c^4}$$

Mathematica [A]
time = 0.20, size = 244, normalized size = 0.49

$$\frac{d\sqrt{d-c^2dx^2}\left(-11025a^2(1-c^2x^2)^{5/2}(2+5c^2x^2)+210abcx(210+35c^2x^2-168c^4x^4+75c^6x^6)+2b^2\sqrt{1-c^2x^2}(18692-1679c^2x^2-2178c^4x^4+1125c^6x^6)+210b\left(-105a(1-c^2x^2)^{5/2}(2+5c^2x^2)+bcx(210+35c^2x^2-168c^4x^4+75c^6x^6)\right)\mathrm{ArcSin}(cx)-11025b^2(1-c^2x^2)^{5/2}(2+5c^2x^2)\,\mathrm{ArcSin}(cx)^2\right)}{385875c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-11025*a^2*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + 21
0*a*b*c*x*(210 + 35*c^2*x^2 - 168*c^4*x^4 + 75*c^6*x^6) + 2*b^2*Sqrt[1 - c^
2*x^2]*(18692 - 1679*c^2*x^2 - 2178*c^4*x^4 + 1125*c^6*x^6) + 210*b*(-105*a
```

```
*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + b*c*x*(210 + 35*c^2*x^2 - 168*c^4*x^
4 + 75*c^6*x^6))*ArcSin[c*x] - 11025*b^2*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2
)*ArcSin[c*x]^2))/(385875*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.43, size = 1678, normalized size = 3.34

method	result	size
default	Expression too large to display	1678

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+b
^2*(-1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+
1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(14*I*arcsin(c*
x)+49*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)+1/16000*(-d*(c^2*x^2-1))^(1/2)*(16
*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcs
in(c*x)^2-2)*d/c^4/(c^2*x^2-1)+1/1152*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c
^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*ar
csin(c*x)+9*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)
*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c
^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x
^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/1152*(-d*(c^2*x
^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/
2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)+
1/16000*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-
20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^
2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-1/43904*(
-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c
^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4
*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(
c*x)^2-2)*d/c^4/(c^2*x^2-1))+2*a*b*(-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*
x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2
+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+
1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^4/(c^2*x^2-1
)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin
(c*x)-I)*d/c^4/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin
(c*x))*d/c^4/(c^2*x^2-1)+3/39200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/
2)*x*c+c^2*x^2-1)*(2*I+35*arcsin(c*x))*cos(6*arcsin(c*x))*d/c^4/(c^2*x^2-1)
+1/78400*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(37*I+
```

```
35*arcsin(c*x))*sin(6*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/2400*(-d*(c^2*x^2-1)
)^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(7*I+15*arcsin(c*x))*cos(4*arc
sin(c*x))*d/c^4/(c^2*x^2-1)-1/4800*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-
c^2*x^2+1)^(1/2)-I)*(11*I+45*arcsin(c*x))*sin(4*arcsin(c*x))*d/c^4/(c^2*x^2
-1))
```

Maxima [A]
time = 0.53, size = 356, normalized size = 0.71

$$-\frac{1}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)b^2\arcsin\left(cx\right)^2-\frac{2}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)ab\arcsin\left(cx\right)-\frac{1}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)a^2+\frac{2}{385875}b^2\left(\frac{1125\sqrt{-c^2x^2+1}\,c^4d^{\frac{3}{2}}x^6-2178\sqrt{-c^2x^2+1}\,c^2d^{\frac{3}{2}}x^4-1679\sqrt{-c^2x^2+1}\,d^{\frac{3}{2}}x^2+\frac{18692\sqrt{-c^2x^2+1}\,d^{\frac{3}{2}}}{c^2}}{c^2}+\frac{105\left(75c^6d^{\frac{3}{2}}x^7-168c^4d^{\frac{3}{2}}x^5+35c^2d^{\frac{3}{2}}x^3+210d^{\frac{3}{2}}x\right)\arcsin\left(cx\right)}{c^3}\right)+\frac{2\left(75c^6d^{\frac{3}{2}}x^7-168c^4d^{\frac{3}{2}}x^5+35c^2d^{\frac{3}{2}}x^3+210d^{\frac{3}{2}}x\right)ab}{3675c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(5/2)/(c^4
*d))*b^2*arcsin(c*x)^2 - 2/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c
^2*d*x^2 + d)^(5/2)/(c^4*d))*a*b*arcsin(c*x) - 1/35*(5*(-c^2*d*x^2 + d)^(5/
2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(5/2)/(c^4*d))*a^2 + 2/385875*b^2*((112
5*sqrt(-c^2*x^2 + 1)*c^4*d^(3/2)*x^6 - 2178*sqrt(-c^2*x^2 + 1)*c^2*d^(3/2)*
x^4 - 1679*sqrt(-c^2*x^2 + 1)*d^(3/2)*x^2 + 18692*sqrt(-c^2*x^2 + 1)*d^(3/2
)/c^2)/c^2 + 105*(75*c^6*d^(3/2)*x^7 - 168*c^4*d^(3/2)*x^5 + 35*c^2*d^(3/2)
*x^3 + 210*d^(3/2)*x)*arcsin(c*x)/c^3) + 2/3675*(75*c^6*d^(3/2)*x^7 - 168*c
^4*d^(3/2)*x^5 + 35*c^2*d^(3/2)*x^3 + 210*d^(3/2)*x)*a*b/c^3
```

Fricas [A]
time = 1.92, size = 360, normalized size = 0.72

$$-\frac{210\left(75abc^7dx^7-168abc^5dx^5+35abc^3dx^3+210abcdx+\left(75b^2c^7dx^7-168b^2c^5dx^5+35b^2c^3dx^3+210b^2cdx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+\left(1125\left(49a^2-2b^2\right)c^8dx^8-9\left(15925a^2-734b^2\right)c^6dx^6+\left(99225a^2-998b^2\right)c^4dx^4+\left(11025a^2-40742b^2\right)c^2dx^2+11025\left(5b^2c^8dx^8-13b^2c^6dx^6+9b^2c^4dx^4+b^2c^2dx^2-2b^2d\right)\arcsin\left(cx\right)^2-2\left(11025a^2-18692b^2\right)d+22050\left(5abc^8dx^8-13abc^6dx^6+9abc^4dx^4+abc^2dx^2-2abd\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{385875\left(c^6x^2-c^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] -1/385875*(210*(75*a*b*c^7*d*x^7 - 168*a*b*c^5*d*x^5 + 35*a*b*c^3*d*x^3 + 2
10*a*b*c*d*x + (75*b^2*c^7*d*x^7 - 168*b^2*c^5*d*x^5 + 35*b^2*c^3*d*x^3 + 2
10*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + (1125*
(49*a^2 - 2*b^2)*c^8*d*x^8 - 9*(15925*a^2 - 734*b^2)*c^6*d*x^6 + (99225*a^2
 - 998*b^2)*c^4*d*x^4 + (11025*a^2 - 40742*b^2)*c^2*d*x^2 + 11025*(5*b^2*c^
8*d*x^8 - 13*b^2*c^6*d*x^6 + 9*b^2*c^4*d*x^4 + b^2*c^2*d*x^2 - 2*b^2*d)*arc
sin(c*x)^2 - 2*(11025*a^2 - 18692*b^2)*d + 22050*(5*a*b*c^8*d*x^8 - 13*a*b*
c^6*d*x^6 + 9*a*b*c^4*d*x^4 + a*b*c^2*d*x^2 - 2*a*b*d)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^3\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.219 $\int x^2(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=421

$$-\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}+\frac{7b^2d\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)}{1152c^3\sqrt{1-c^2x^2}}+\frac{bdx^2\sqrt{}}{}$$

```
[Out] 1/6*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-7/1152*b^2*d*x*(-c^2*d*x^2
+d)^(1/2)/c^2-43/1728*b^2*d*x^3*(-c^2*d*x^2+d)^(1/2)+1/108*b^2*c^2*d*x^5*(-
c^2*d*x^2+d)^(1/2)-1/16*d*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/
8*d*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+7/1152*b^2*d*arcsin(c*x)*(
-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/16*b*d*x^2*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-7/48*b*c*d*x^4*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/18*b*c^3*d*x^6*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/48*d*(a+b*arcsin(c*x))^3*(-c^2*d*x
^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.45, antiderivative size = 421, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4787, 4783, 4795, 4737, 4723, 327, 222, 14, 4777, 12, 470}

$$\frac{bdx^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{16c\sqrt{1-c^2x^2}}-\frac{dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{16c^2}-\frac{7bcdx^4\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{48\sqrt{1-c^2x^2}}+\frac{1}{6}x^3(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2+\frac{1}{8}dx^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2+\frac{d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^3}{48bc^3\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{18\sqrt{1-c^2x^2}}+\frac{7b^2d\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{1152c^3\sqrt{1-c^2x^2}}-\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-7*b^2*d*x*Sqrt[d - c^2*d*x^2])/(1152*c^2) - (43*b^2*d*x^3*Sqrt[d - c^2*d*
x^2])/1728 + (b^2*c^2*d*x^5*Sqrt[d - c^2*d*x^2])/108 + (7*b^2*d*Sqrt[d - c^
2*d*x^2]*ArcSin[c*x])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^2*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^2)/8 + (x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(48*b*c^3*Sqrt[1 - c^2*x
^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{2}d\int x^2\sqrt{d-c^2dx^2}\,(a$$

$$=-\frac{bcdx^4\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{12\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}\,(a+}{18\sqrt{1-c^2x}}$$

$$=-\frac{7bcdx^4\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{48\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}\,(a}{18\sqrt{1-c}}$$

$$=-\frac{1}{64}b^2dx^3\sqrt{d-c^2dx^2}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}+\frac{bdx^2\sqrt{d-}}{}$$

$$=\frac{b^2dx\sqrt{d-c^2dx^2}}{128c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c}$$

$$=-\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d}$$

$$=-\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d}$$

Mathematica [A]
time = 0.20, size = 297, normalized size = 0.71

$$\frac{d\sqrt{d-c^2dx^2}\left(72a^3+24ab^2c^2x^2(9-21c^2x^2+8c^4x^4)-72a^2bcx\sqrt{1-c^2x^2}\,(3-14c^2x^2+8c^4x^4)+b^3cx\sqrt{1-c^2x^2}\,(-21-86c^2x^2+32c^4x^4)+3b\left(72a^2-48abcx\sqrt{1-c^2x^2}\,(3-14c^2x^2+8c^4x^4)+b^2(7+72c^2x^2-168c^4x^4+64c^6x^6)\right)\mathrm{ArcSin}(cx)+72b^2\left(3a+bcx\sqrt{1-c^2x^2}\,(-3+14c^2x^2-8c^4x^4)\right)\mathrm{ArcSin}(cx)^2+72b^3\mathrm{ArcSin}(cx)^3\right)}{3456bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(72*a^3 + 24*a*b^2*c^2*x^2*(9 - 21*c^2*x^2 + 8*c^4*x
^4) - 72*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + b^3*c*x
*Sqrt[1 - c^2*x^2]*(-21 - 86*c^2*x^2 + 32*c^4*x^4) + 3*b*(72*a^2 - 48*a*b*c
*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + b^2*(7 + 72*c^2*x^2 - 1
68*c^4*x^4 + 64*c^6*x^6))*ArcSin[c*x] + 72*b^2*(3*a + b*c*x*Sqrt[1 - c^2*x^
2]*(-3 + 14*c^2*x^2 - 8*c^4*x^4))*ArcSin[c*x]^2 + 72*b^3*ArcSin[c*x]^3))/(3
456*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.50, size = 1320, normalized size = 3.14

method	result	size

default	Expression too large to display	1320

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*a^2*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/24*a^2/c^2*x*(-c^2*d*x^2+d)^(3/2)+1
/16*a^2/c^2*d*x*(-c^2*d*x^2+d)^(1/2)+1/16*a^2/c^2*d^2/(c^2*d)^(1/2)*arctan(
(c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/48*(-d*(c^2*x^2-1))^(1/2)*(-c
^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*d-1/6912*(-d*(c^2*x^2-1))^(1/
2)*(-32*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4
*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(
1/2)-6*c*x)*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)+1/256*(-
d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+
1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)+1/27
648*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(132*I*arcs
in(c*x)+144*arcsin(c*x)^2-23)*cos(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/27648*
(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(84*I*arcsin(c*
x)+288*arcsin(c*x)^2-31)*sin(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/1024*(-d*(c
^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(4*I*arcsin(c*x)+16*a
rcsin(c*x)^2-5)*cos(3*arcsin(c*x))*d/c^3/(c^2*x^2-1)+3/1024*(-d*(c^2*x^2-1)
)^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(I+4*arcsin(c*x))*sin(3*arcsin
(c*x))*d/c^3/(c^2*x^2-1))+2*a*b*(-1/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*d-1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*
(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^
5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x
)*(I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(
c*x))*d/c^3/(c^2*x^2-1)+1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*
x^2+1)^(1/2)-I)*(11*I+24*arcsin(c*x))*cos(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-
1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(7*I+48*
arcsin(c*x))*sin(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1
/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(I+8*arcsin(c*x))*cos(3*arcsin(c*x
))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+
1)^(1/2)-I)*sin(3*arcsin(c*x))*d/c^3/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] 1/48*a^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*
d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/2)*arcsin(c*x)/c^3) + sqrt(d)*
integrate(-((b^2*c^2*d*x^4 - b^2*d*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))^2 + 2*(a*b*c^2*d*x^4 - a*b*d*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^4 - a^2*d*x^2 + (b^2*c^2*d*x^4 - b^2*d*x^2)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*x^4 - a*b*d*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.220 $\int x(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=279

$$\frac{16b^2d\sqrt{d-c^2dx^2}}{75c^2}+\frac{8b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2}+\frac{2b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{2bdx\sqrt{d-c^2dx^2}\,(a+b\text{Arc}}{5c\sqrt{1-c^2x^2}}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/c^2/d+16/75*b^2*d*(-c^2*d*x^2
+d)^(1/2)/c^2+8/225*b^2*d*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+2/125*b^2*d
*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+2/5*b*d*x*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*x^3*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*x^5*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}=0.222$, Rules used = {4767, 200, 4739, 12, 1261, 712}

$$\frac{2bdx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{5c\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{5c^2d}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dx^5\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{25\sqrt{1-c^2x^2}}+\frac{2b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{16b^2d\sqrt{d-c^2dx^2}}{75c^2}+\frac{8b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (16*b^2*d*Sqrt[d - c^2*d*x^2])/(75*c^2) + (8*b^2*d*(1 - c^2*x^2)*Sqrt[d - c
^2*d*x^2])/(225*c^2) + (2*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c
^2) + (2*b*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x
^2]) - (4*b*c*d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c
^2*x^2]) + (2*b*c^3*d*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
```

```
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=-\frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{5c^2d}+\frac{\left(2bd\sqrt{d-c^2dx^2}\right)\int(1-}{5c\sqrt{1}}$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\,(a+b}{15\sqrt{1-c^2x^2}}$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\,(a+b}{15\sqrt{1-c^2x^2}}$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\,(a+b}{15\sqrt{1-c^2x^2}}$$

$$=\frac{2bdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}\,(a+b}{15\sqrt{1-c^2x^2}}$$

$$=\frac{16b^2d\sqrt{d-c^2dx^2}}{75c^2}+\frac{8b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2}+\frac{2b^2d(1-c}{}$$

Mathematica [A]
time = 0.18, size = 200, normalized size = 0.72

$$-\frac{d\sqrt{d-c^2dx^2}\left(225a^2(-1+c^2x^2)^3+30abcx\sqrt{1-c^2x^2}\,(15-10c^2x^2+3c^4x^4)+2b^2(149-187c^2x^2+47c^4x^4-9c^6x^6)+30b\left(15a(-1+c^2x^2)^3+bcx\sqrt{1-c^2x^2}\,(15-10c^2x^2+3c^4x^4)\right)\operatorname{ArcSin}(cx)+225b^2(-1+c^2x^2)^3\operatorname{ArcSin}(cx)^2\right)}{1125c^2\,(-1+c^2x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/1125*(d*Sqrt[d - c^2*d*x^2]*(225*a^2*(-1 + c^2*x^2)^3 + 30*a*b*c*x*Sqrt[
1 - c^2*x^2]*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 2*b^2*(149 - 187*c^2*x^2 + 47*
c^4*x^4 - 9*c^6*x^6) + 30*b*(15*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 - c^2*x^2
]*(15 - 10*c^2*x^2 + 3*c^4*x^4))*ArcSin[c*x] + 225*b^2*(-1 + c^2*x^2)^3*Arc
Sin[c*x]^2))/(c^2*(-1 + c^2*x^2))
```

Maple [C] Result contains complex when optimal does not.
time = 0.27, size = 1151, normalized size = 4.13

method	result
default	$-\frac{a^2(-c^2dx^2+d)^{\frac{5}{2}}}{5c^2d}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\left(16c^6x^6-28c^4x^4-16i\sqrt{-c^2x^2+1}\,x^5c^5+13c^2x^2+20i\sqrt{-c^2x^2+1}\right.}{4000c^2(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*a^2/c^2/d*(-c^2*d*x^2+d)^(5/2)+b^2*(-1/4000*(-d*(c^2*x^2-1))^(1/2)*(16
*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcs
in(c*x)^2-2)*d/c^2/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^
2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arc
sin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(
c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c^2
/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1
))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x
*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/40
00*(-d*(c^2*x^2-1))^(1/2)*(16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+16*c^6*x^6-20*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2
-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1))+2*a*b*(-1/800
*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*
c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1
)*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-
I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2
*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^2/(
c^2*x^2-1)+1/96*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^
```

```
4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^2/(c^2
*x^2-1)-1/1200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*
(11*I+45*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x
^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(7*I+15*arcsin(c*x))*sin(
4*arcsin(c*x))*d/c^2/(c^2*x^2-1))
```

Maxima [A]
time = 0.52, size = 236, normalized size = 0.85

$$-\frac{(-c^2dx^2+d)^{\frac{5}{2}}b^2\arcsin(cx)^2}{5\,c^2d}+\frac{2}{1125}b^2\left(\frac{9\sqrt{-c^2x^2+1}\,c^2d^{\frac{5}{2}}x^4-38\sqrt{-c^2x^2+1}\,d^{\frac{5}{2}}x^2+\frac{149\sqrt{-c^2x^2+1}\,d^{\frac{5}{2}}}{c^2}}{d}+\frac{15\left(3\,c^4d^{\frac{5}{2}}x^5-10\,c^2d^{\frac{5}{2}}x^3+15\,d^{\frac{5}{2}}x\right)\arcsin(cx)}{cd}\right)-\frac{2\,(-c^2dx^2+d)^{\frac{5}{2}}ab\arcsin(cx)}{5\,c^2d}-\frac{(-c^2dx^2+d)^{\frac{5}{2}}a^2}{5\,c^2d}+\frac{2\left(3\,c^4d^{\frac{5}{2}}x^5-10\,c^2d^{\frac{5}{2}}x^3+15\,d^{\frac{5}{2}}x\right)ab}{75\,cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/5*(-c^2*d*x^2 + d)^(5/2)*b^2*arcsin(c*x)^2/(c^2*d) + 2/1125*b^2*((9*sqrt
(-c^2*x^2 + 1)*c^2*d^(5/2)*x^4 - 38*sqrt(-c^2*x^2 + 1)*d^(5/2)*x^2 + 149*sq
rt(-c^2*x^2 + 1)*d^(5/2)/c^2)/d + 15*(3*c^4*d^(5/2)*x^5 - 10*c^2*d^(5/2)*x^
3 + 15*d^(5/2)*x)*arcsin(c*x)/(c*d)) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a*b*arcsi
n(c*x)/(c^2*d) - 1/5*(-c^2*d*x^2 + d)^(5/2)*a^2/(c^2*d) + 2/75*(3*c^4*d^(5/
2)*x^5 - 10*c^2*d^(5/2)*x^3 + 15*d^(5/2)*x)*a*b/(c*d)
```

Fricas [A]
time = 2.08, size = 295, normalized size = 1.06

$$-\frac{30\,(3\,abc^5dx^5-10\,abc^3dx^3+15\,abcdx+(3\,b^2c^5dx^5-10\,b^2c^3dx^3+15\,b^2cdx)\arcsin(cx))\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+(9\,(25\,a^2-2\,b^2)c^6dx^6-(675\,a^2-94\,b^2)c^4dx^4+(675\,a^2-374\,b^2)c^2dx^2+225\,(b^2c^6dx^6-3\,b^2c^4dx^4+3\,b^2c^2dx^2-b^2d)\arcsin(cx)^2-(225\,a^2-298\,b^2)d+450\,(abc^6dx^6-3\,abc^4dx^4+3\,abc^2dx^2-abd)\arcsin(cx))\sqrt{-c^2dx^2+d}}{1125\,(c^4x^2-c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/1125*(30*(3*a*b*c^5*d*x^5 - 10*a*b*c^3*d*x^3 + 15*a*b*c*d*x + (3*b^2*c^5
*d*x^5 - 10*b^2*c^3*d*x^3 + 15*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)
*sqrt(-c^2*x^2 + 1) + (9*(25*a^2 - 2*b^2)*c^6*d*x^6 - (675*a^2 - 94*b^2)*c^
4*d*x^4 + (675*a^2 - 374*b^2)*c^2*d*x^2 + 225*(b^2*c^6*d*x^6 - 3*b^2*c^4*d*
x^4 + 3*b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 - (225*a^2 - 298*b^2)*d + 450*
(a*b*c^6*d*x^6 - 3*a*b*c^4*d*x^4 + 3*a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sq
rt(-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.221 $\int \left(d-c^2dx^2\right)^{3/2} (a+b\mathbf{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=305

$$-\frac{17}{64}b^2dx\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2dx^3\sqrt{d-c^2dx^2}+\frac{17b^2d\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)}{64c\sqrt{1-c^2x^2}}-\frac{5bcdx^2\sqrt{d-c^2dx^2}\,(a+b\text{A}}{8\sqrt{1-c^2x^2}}$$

```
[Out] 1/4*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-17/64*b^2*d*x*(-c^2*d*x^2+d)
^(1/2)+1/32*b^2*c^2*d*x^3*(-c^2*d*x^2+d)^(1/2)+3/8*d*x*(a+b*arcsin(c*x))^2*
(-c^2*d*x^2+d)^(1/2)+17/64*b^2*d*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x
^2+1)^(1/2)-5/8*b*c*d*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)+1/8*b*c^3*d*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)+1/8*d*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/
2)
```

Rubi [A]
time = 0.17, antiderivative size = 307, normalized size of antiderivative = 1.01, number of steps used = 10, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\frac{d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^3}{8bc\sqrt{1-c^2x^2}}+\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))^2+\frac{3}{8}dx\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2+\frac{bd\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8c}-\frac{3bcdx^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{8\sqrt{1-c^2x^2}}+\frac{9b^2d\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{64c\sqrt{1-c^2x^2}}-\frac{15}{64}b^2dx\sqrt{d-c^2dx^2}-\frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-15*b^2*d*x*Sqrt[d - c^2*d*x^2])/64 - (b^2*d*x*(1 - c^2*x^2)*Sqrt[d - c^2*
d*x^2])/32 + (9*b^2*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c*Sqrt[1 - c^2*x
^2]) - (3*b*c*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^
2*x^2]) + (b*d*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(8*c) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/8 + (x*(d - c^2*
d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x])^3)/(8*b*c*Sqrt[1 - c^2*x^2])
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
```

```
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx = \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{4}(3d)\int \sqrt{d-c^2dx^2}\, (a+$$

$$= \frac{bd\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{8c} + \frac{3}{8}dx\sqrt{d-c^2dx^2}$$

$$= -\frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{3bcdx^2\sqrt{d-c^2dx^2}\,(a+b\sin}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{15}{64}b^2dx\sqrt{d-c^2dx^2} - \frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{3bcdx}{}$$

$$= -\frac{15}{64}b^2dx\sqrt{d-c^2dx^2} - \frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{9b^2d\sqrt{}}{}$$

Mathematica [A]
time = 0.71, size = 329, normalized size = 1.08

$$\frac{32b^2d\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)^3 - 96a^2d^{3/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right) + 8bd\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)^2(12a+8b\sin(2\text{ArcSin}(cx))+b\sin(4\text{ArcSin}(cx))) + d\sqrt{d-c^2dx^2}\left(160a^2cx\sqrt{1-c^2x^2} - 64a^2c^3x^3\sqrt{1-c^2x^2} + 64ab\cos(2\text{ArcSin}(cx)) + 4ab\cos(4\text{ArcSin}(cx)) - 32b^2\sin(2\text{ArcSin}(cx)) - b^2\sin(4\text{ArcSin}(cx))\right) + 4bd\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)(16b\cos(2\text{ArcSin}(cx)) + b\cos(4\text{ArcSin}(cx)) + 4a(8\sin(2\text{ArcSin}(cx)) + \sin(4\text{ArcSin}(cx))))}{256c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*Sqrt[1 - c^2*x
^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 8*b*d*Sqrt
[d - c^2*d*x^2]*ArcSin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcS
in[c*x]]) + d*Sqrt[d - c^2*d*x^2]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c
^3*x^3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c
*x]] - 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*Sqrt[d -
 c^2*d*x^2]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[c*x]] + 4
*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.18, size = 929, normalized size = 3.05

method	result

default	$\frac{x\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}a^{2}}{4}+\frac{3a^{2}dx\sqrt{-c^{2}d\,x^{2}+d}}{8}+\frac{3a^{2}d^{2}\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{8\sqrt{c^{2}d}}+b^{2}\left(-\frac{\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\sqrt{-}}{8c(c^{2}x^{2}}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*x*(-c^2*d*x^2+d)^(3/2)*a^2+3/8*a^2*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a^2*d^2
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/8*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*d-1/512*(-
d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x
^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arcsin(c*x)
+8*arcsin(c*x)^2-1)*d/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*
x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x
)+2*arcsin(c*x)^2-1)*d/c/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*(68*I*arcsin(c*x)+56*arcsin(c*x)^2-31)*cos(3*ar
csin(c*x))*d/c/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/
2)*x*c+c^2*x^2-1)*(20*I*arcsin(c*x)+24*arcsin(c*x)^2-11)*sin(3*arcsin(c*x))
*d/c/(c^2*x^2-1))+2*a*b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/
(c^2*x^2-1)*arcsin(c*x)^2*d-1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)
^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*
x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*d/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))
^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x
)*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d/c/(c
^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)
*(5*I+12*arcsin(c*x))*sin(3*arcsin(c*x))*d/c/(c^2*x^2-1))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a^2 + sqrt(d)*integrate(-((b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \left(-d(cx-1)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(a+b\,\mathrm{asin}(c\,x)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.222 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=545

$$-\frac{22}{9}b^2d\sqrt{d-c^2dx^2}-\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2}{27}b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}-\frac{2b^2cdx\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)}{\sqrt{1-c^2x^2}}-$$

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-22/9*b^2*d*(-c^2*d*x^2+d)^(1/2
)-2/27*b^2*d*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)+d*(a+b*arcsin(c*x))^2*(-c^2*
d*x^2+d)^(1/2)-2*a*b*c*d*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*c*
d*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/3*b*c*d*x*(a+b*ar
csin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/9*b*c^3*d*x^3*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*d*(a+b*arcsin(c*x))^2*a
rctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*
I*b*d*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)
^(1/2)/(-c^2*x^2+1)^(1/2)-2*I*b*d*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*d*polylog(3,-I*c
*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*d*poly
log(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.40, antiderivative size = 545, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45}

$$\frac{2ibd\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2ibd\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2bcdx\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{1}{3}(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2+d\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2-\frac{2d\sqrt{d-c^2dx^2}\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+\frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}-\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2d\sqrt{d-c^2dx^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{2b^2d\sqrt{d-c^2dx^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2cdx\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{22}{9}b^2d\sqrt{d-c^2dx^2}-\frac{2}{27}b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (-22*b^2*d*Sqrt[d - c^2*d*x^2])/9 - (2*a*b*c*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] - (2*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/27 - (2*b^2*c*d*
x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*x*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^3*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^2 + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^
2)/3 - (2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2] - (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1
- c^2*x^2] + (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sq
rt[1 - c^2*x^2]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + d\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-}\right.}{x}$$

$$= -\frac{2bcdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}\,(a+}{9\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{2b}{}$$

$$= -\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cdx\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{}}{}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d\left(1-c^2x^2\right)\sqrt{}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d\left(1-c^2x^2\right)\sqrt{}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d\left(1-c^2x^2\right)\sqrt{}$$

Mathematica [A]
time = 1.60, size = 576, normalized size = 1.06

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -1/3*(a^2*d*(-4 + c^2*x^2)*Sqrt[d - c^2*d*x^2]) + a^2*d^(3/2)*Log[c*x] - a^
2*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*d*Sqrt[d - c^2*d*x^
2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSi
n[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcS
in[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b^2*d*Sq
rt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x
^2]*ArcSin[c*x]^2 - ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(
I*ArcSin[c*x])]) - (2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - Poly
Log[2, E^(I*ArcSin[c*x])]) + 2*(PolyLog[3, -E^(I*ArcSin[c*x])] - PolyLog[3,
 E^(I*ArcSin[c*x])])))/Sqrt[1 - c^2*x^2] - (a*b*d*Sqrt[d - c^2*d*x^2]*(9*c*
x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin
```

```
[c*x]]))/(18*Sqrt[1 - c^2*x^2]) + (b^2*d*Sqrt[d - c^2*d*x^2]*(27*Sqrt[1 - c
^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] -
6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108*Sqrt[1 - c^2*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1275 vs. $2(529) = 1058$.
time = 0.30, size = 1276, normalized size = 2.34

method	result
default	$\frac{b^2\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{-c^2x^2+1}\,d\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)}{c^2x^2-1}-\frac{b^2\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{-c^2x^2+\ldots}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -a^2*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a^2*(-c^2*d*x^2+d)^
(1/2)*d+68/27*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)+b^2*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+
1)^(1/2))-b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsi
n(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c
^2*x^2-1)*arcsin(c*x)^2*x^4*c^4+5/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1
)*arcsin(c*x)^2*x^2*c^2+2/27*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*x^4*c
^4-70/27*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*x^2*c^2+2*b^2*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*polylog(3,-I*c*x-(-c^2*x^2+1)^
(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*polylo
g(3,I*c*x+(-c^2*x^2+1)^(1/2))-4/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*
arcsin(c*x)^2+1/3*(-c^2*d*x^2+d)^(3/2)*a^2+8/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d
/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x*c-2/9*b^2*(-d*(c^2*x^2-1))^(1
/2)*d/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^3*c^3-8/3*a*b*(-d*(c^2*x
^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*
x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)/(c^2*x^2-1)*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2/3*a*b*(-d
*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4+10/3*a*b*(-d*(c^2*x^2
-1))^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2-2/9*a*b*(-d*(c^2*x^2-1))^(1/2)
*d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3*c^3+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/
(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c+2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(-c^
2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*ln(1-I*c*x-
(-c^2*x^2+1)^(1/2))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*
x^2-1)*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/3*(3*d^(3/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (
-c^2*d*x^2 + d)^(3/2) - 3*sqrt(-c^2*d*x^2 + d)*d)*a^2 - sqrt(d)*integrate((
(b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a
*b*c^2*d*x^2 - a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x
+ 1)*sqrt(-c*x + 1)/x, x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})^{2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))^2\,(d - c^2\,d\,x^2)^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x, x)
```

3.223 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=424

$$\frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2}-\frac{5b^2cd\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)}{4\sqrt{1-c^2x^2}}+\frac{3bc^3dx^2\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}+bcd\sqrt{1-c^2x}$$

```
[Out] -(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x+1/4*b^2*c^2*d*x*(-c^2*d*x^2+d)^
(1/2)-3/2*c^2*d*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-5/4*b^2*c*d*arcs
in(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/2*b*c^3*d*x^2*(a+b*arcsin
(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*c*d*(a+b*arcsin(c*x))^2*(-
c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*c*d*(a+b*arcsin(c*x))^3*(-c^2*d*x
^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c*d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*d*polylo
g(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+b
*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]

time = 0.28, antiderivative size = 424, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.448$, Rules used = {4785, 4741, 4737, 4723, 327, 222, 4773, 4721, 3798, 2221, 2317, 2438, 201}

$$-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2-\frac{cd\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^3}{2b\sqrt{1-c^2x^2}}-\frac{icd\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+bcd\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))-\frac{(d-c^2dx^2)^{3/2}(a+b\mathrm{ArcSin}(cx))^2}{x}+\frac{2bcd\sqrt{d-c^2dx^2}\,\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{3bc^3dx^2\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}-\frac{ib^2cd\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(e^{2i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{5b^2cd\mathrm{ArcSin}(cx)\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (b^2*c^2*d*x*Sqrt[d - c^2*d*x^2])/4 - (5*b^2*c*d*Sqrt[d - c^2*d*x^2]*ArcSin
[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]) - (3*c^2*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/2 - (I*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^
2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x - (c*d*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - (I*b^2*c*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt
[1 - c^2*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
```

```
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \left(3c^2d\right)\int \sqrt{d-c^2dx^2}\,\left(a+b\mathrm{s}\right.$$

$$= bcd\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\,\left(a+b\sin^{-1}(cx)\right) - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}\,\left(\right.$$

$$= -\frac{1}{2}b^2c^2dx\sqrt{d-c^2dx^2} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}\,\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + b$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{b^2cd\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{2\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-}}{2}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d}}{}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d}}{}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d}}{}$$

Mathematica [A]
time = 1.63, size = 396, normalized size = 0.93

$$\frac{-12a^2d\sqrt{1-c^2x^2}\,(2+c^2x^2)\sqrt{d-c^2dx^2}+36a^2cd^{3/2}x\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)-24abd\sqrt{d-c^2dx^2}\left(2\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)+cx\mathrm{ArcSin}(cx)^2-2cx\log(cx)\right)-8b^2d\sqrt{d-c^2dx^2}\left(\mathrm{ArcSin}(cx)\left(3\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)+cx\mathrm{ArcSin}(cx)(3i+\mathrm{ArcSin}(cx))-6cx\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)\right)+3icx\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)-b^2cdx\sqrt{d-c^2dx^2}\,(4\mathrm{ArcSin}(cx)^3+6\mathrm{ArcSin}(cx)\cos(2\mathrm{ArcSin}(cx))+(-3+6\mathrm{ArcSin}(cx)^2)\sin(2\mathrm{ArcSin}(cx)))-6abcdx\sqrt{d-c^2dx^2}\,(\cos(2\mathrm{ArcSin}(cx))+2\mathrm{ArcSin}(cx)(\mathrm{ArcSin}(cx)+\sin(2\mathrm{ArcSin}(cx))))}{24x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (-12*a^2*d*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*Sqrt[d - c^2*d*x^2] + 36*a^2*c*d
^(3/2)*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 +
c^2*x^2))] - 24*a*b*d*Sqrt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]
+ c*x*ArcSin[c*x]^2 - 2*c*x*Log[c*x]) - 8*b^2*d*Sqrt[d - c^2*d*x^2]*(ArcSin
[c*x]*(3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + c*x*ArcSin[c*x]*(3*I + ArcSin[c*x]
) - 6*c*x*Log[1 - E^((2*I)*ArcSin[c*x])]) + (3*I)*c*x*PolyLog[2, E^((2*I)*A
rcSin[c*x])]) - b^2*c*d*x*Sqrt[d - c^2*d*x^2]*(4*ArcSin[c*x]^3 + 6*ArcSin[c
*x]*Cos[2*ArcSin[c*x]] + (-3 + 6*ArcSin[c*x]^2)*Sin[2*ArcSin[c*x]]) - 6*a*b
*c*d*x*Sqrt[d - c^2*d*x^2]*(Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x]
 + Sin[2*ArcSin[c*x]])))/(24*x*Sqrt[1 - c^2*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1147 vs. 2(398) = 796.
time = 0.37, size = 1148, normalized size = 2.71

method	result
default	$\frac{b^2\sqrt{-d\,(c^2x^2-1)}\,d\,c^4x^3}{4c^2x^2-4}-\frac{3a^2c^2d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}-\frac{3a^2c^2dx\sqrt{-c^2d\,x^2+d}}{2}+\frac{b^2\sqrt{-d\,(c^2x^2}{(c^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*arcsin(c*x)*d
*c-3/2*a^2*c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2
))-3/2*a^2*c^2*d*x*(-c^2*d*x^2+d)^(1/2)+I*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c
^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d
*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+b^2*
(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2*d/(c^2*x^2-1)/x+1/4*b^2*(-d*(c^2*x^2-1
))^(1/2)*d*c^4/(c^2*x^2-1)*x^3-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^
2-1)*x-a^2*c^2*x*(-c^2*d*x^2+d)^(3/2)-a^2/d/x*(-c^2*d*x^2+d)^(5/2)+1/2*b^2*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*d*c-1/2
*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)^2*x^3-1/2*b^2*(-d
*(c^2*x^2-1))^(1/2)*d*c^2/(c^2*x^2-1)*arcsin(c*x)^2*x+1/4*b^2*(-d*(c^2*x^2-
1))^(1/2)*d*c/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+3/2*a*b*(-d*(c^2*x
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*d*c-a*b*(-d*(c^2*
x^2-1))^(1/2)*d*c^4/(c^2*x^2-1)*arcsin(c*x)*x^3-1/2*a*b*(-d*(c^2*x^2-1))^(1
/2)*d*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2-a*b*(-d*(c^2*x^2-1))^(1/2)*d*c
^2/(c^2*x^2-1)*arcsin(c*x)*x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d*c+2*I*b^2*(-d*(c^2*x^2-1
))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2))-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)*x^2-2*b^2*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*
d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))+1/4*a*b*(-d*(c^2*x^2-1))^(1/2)*d*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+2*a*b*
(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*d/(c^2*x^2-1)/x
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] -1/2*(3*sqrt(-c^2*d*x^2 + d)*c^2*d*x + 3*c*d^(3/2)*arcsin(c*x) + 2*(-c^2*d*
x^2 + d)^(3/2)/x)*a^2 - sqrt(d)*integrate(((b^2*c^2*d*x^2 - b^2*d)*arctan2(
```

```
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**2,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^2,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^2, x)
```

3.224 $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=590

$$2b^2c^2d\sqrt{d-c^2dx^2}+\frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{3b^2c^3dx\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)}{\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(}{x\sqrt{1-c^2x^2}}$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2+2*b^2*c^2*d*(-c^2*d*x^2+d
)^(1/2)-3/2*c^2*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+3*a*b*c^3*d*x*(-
c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3*b^2*c^3*d*x*arcsin(c*x)*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b*c*d*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x
/(-c^2*x^2+1)^(1/2)-b*c^3*d*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*
x^2+1)^(1/2)+3*c^2*d*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b^2*c^2*d*arctanh((-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3*I*b*c^2*d*(a+b*arcsin(c*x))*po
lylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+
3*I*b*c^2*d*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3*b^2*c^2*d*polylog(3,-I*c*x-(-c^2*x^2+1)^(1
/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3*b^2*c^2*d*polylog(3,I*c*x+(-
c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.43, antiderivative size = 590, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.517$, Rules used = {4785, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 14, 4777, 457, 81, 65, 214}

$$-\frac{3ibc^2d\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(-e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{3ibc^2d\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2-\frac{bcd\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{x\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}(a+b\mathrm{ArcSin}(cx))^2}{2x^2}+\frac{3c^2d\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}-\frac{bc^3dx\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{3b^2c^2d\sqrt{d-c^2dx^2}\,\mathrm{Li}_3\left(-e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{3b^2c^2d\sqrt{d-c^2dx^2}\,\mathrm{Li}_3\left(e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{3b^2c^3dx\mathrm{ArcSin}(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+2b^2c^2d\sqrt{d-c^2dx^2}-\frac{b^2c^2d\sqrt{d-c^2dx^2}\,\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] 2*b^2*c^2*d*Sqrt[d - c^2*d*x^2] + (3*a*b*c^3*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] + (3*b^2*c^3*d*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2
*x^2] - (b*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2
]) - (b*c^3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2]
- (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - ((d - c^2*d*x^2)^
(3/2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d*S
qrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((3*I)*b
*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x]
)])/Sqrt[1 - c^2*x^2] + ((3*I)*b*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (3*b^2*c^2*d*Sqrt[d
```

```
- c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (3*b^2*c^2
*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 81

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[b*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/(d*f*(n + p +
 2))), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{x^3}\,dx = -\frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{2x^2} - \frac{1}{2}(3c^2d)\int \frac{\sqrt{d-c^2dx^2}\,(a+}{x}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}\,(a+b\sin}{\sqrt{1-c^2x^2}}$$

$$= \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx}{}$$

$$= -b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x}}$$

$$= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

$$= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

$$= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 6.76, size = 813, normalized size = 1.38

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d*(4*a^2*d*(-1 + c^2*x^2)*(1 + 2*c^2*x^2) - 12*a^2*c^2*Sqrt[d]*x^2*Sqrt[d
- c^2*d*x^2]*Log[x] + 12*a^2*c^2*Sqrt[d]*x^2*Sqrt[d - c^2*d*x^2]*Log[d + Sq
rt[d]*Sqrt[d - c^2*d*x^2]] + 16*a*b*c^2*d*x^2*Sqrt[1 - c^2*x^2]*(c*x - Sqrt
[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1
 + E^(I*ArcSin[c*x])]) - I*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(
I*ArcSin[c*x])])) + 8*b^2*c^2*d*x^2*Sqrt[1 - c^2*x^2]*(2*Sqrt[1 - c^2*x^2]
+ 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - ArcSin[c*x]^2*(Log[
1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) - (2*I)*ArcSin[c*x]*(P
olyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) + 2*(PolyLog
[3, -E^(I*ArcSin[c*x])] - PolyLog[3, E^(I*ArcSin[c*x])])) - 2*a*b*c^2*d*x^2
*Sqrt[1 - c^2*x^2]*(2*Cot[ArcSin[c*x]/2] + ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2
```

```
 + 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + E^(I*Ar
cSin[c*x])] + (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, E^(I*
ArcSin[c*x])] - ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 2*Tan[ArcSin[c*x]/2]) -
b^2*c^2*d*x^2*Sqrt[1 - c^2*x^2]*(4*ArcSin[c*x]*Cot[ArcSin[c*x]/2] + ArcSin[
c*x]^2*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]^2*Log[1 - E^(I*ArcSin[c*x])] -
4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] - 8*Log[Tan[ArcSin[c*x]/2]] + (8
*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (8*I)*ArcSin[c*x]*PolyLog[
2, E^(I*ArcSin[c*x])] - 8*PolyLog[3, -E^(I*ArcSin[c*x])] + 8*PolyLog[3, E^(
I*ArcSin[c*x])] - ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]*Tan[Ar
cSin[c*x]/2])))/(8*x^2*Sqrt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1371 vs. 2(576) = 1152.
time = 0.42, size = 1372, normalized size = 2.33

method	result	size
default	Expression too large to display	1372

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2*c^2*(-c^2*d*x^2+d)^(3/2)+a*b*(-d*(c^2*x^2-1))^(1/2)*c^2*d/(c^2*x^2
-1)*arcsin(c*x)+a*b*d*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)+2*
b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d/(c^2*x^2-1)*x^2+1/2*b^2*(-d*(c^2*x^2-1))^(
1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)^2-1/2*a^2/d/x^2*(-c^2*d*x^2+d)^(5/2)-2*b
^2*(-d*(c^2*x^2-1))^(1/2)*c^2*d/(c^2*x^2-1)+1/2*b^2*d*arcsin(c*x)^2*(-d*(c^
2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)-6*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)*c^2*d/(2*c^2*x^2-2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+6*a*b*(
-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2*d/(2*c^2*x^2-2)*arcsin(c*x)*ln
(1-I*c*x-(-c^2*x^2+1)^(1/2))+6*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1
/2)*c^2*d/(2*c^2*x^2-2)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-6*I*a*b*(-c^2*
x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2*d/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))+3/2*a^2*c^2*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2)
)/x)-3/2*a^2*c^2*(-c^2*d*x^2+d)^(1/2)*d-b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d/(c
^2*x^2-1)*arcsin(c*x)^2*x^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
*c^2*d/(c^2*x^2-1)*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))-3*b^2*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(
1/2))+3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*pol
ylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-
3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(
c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(-d*(c^2*x^2-1))^(1/2)*c^4*d
/(c^2*x^2-1)*arcsin(c*x)*x^2-2*a*b*(-d*(c^2*x^2-1))^(1/2)*c^3*d/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*x+a*b*d*(-d*(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+
1)^(1/2)*c+b^2*d*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2
```

```
+1)^(1/2)*c-3/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^
2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3/2*b^2*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)*c^2*d/(c^2*x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x
^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^3*d/(c^2*x^2-1)*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)*x
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
```

```
[Out] 1/2*(3*c^2*d^(3/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))
- (-c^2*d*x^2 + d)^(3/2)*c^2 - 3*sqrt(-c^2*d*x^2 + d)*c^2*d - (-c^2*d*x^2 +
 d)^(5/2)/(d*x^2))*a^2 - sqrt(d)*integrate(((b^2*c^2*d*x^2 - b^2*d)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**3, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^3, x)
```

3.225 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=400

$$-\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x}-\frac{b^2c^3d\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)}{3\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{3x^2}+\frac{c^2d\sqrt{d}\cdots}{}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3-1/3*b^2*c^2*d*(-c^2*d*x^2
+d)^(1/2)/x+c^2*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/x-1/3*b^2*c^3*d*
arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+4/3*I*c^3*d*(a+b*arcsin
(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/3*c^3*d*(a+b*arcsin(c*x)
)^3*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)-8/3*b*c^3*d*(a+b*arcsin(c*x))
*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
+4/3*I*b^2*c^3*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-1/3*b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*(-c^2*
d*x^2+d)^(1/2)/x^2
```

Rubi [A]
time = 0.39, antiderivative size = 400, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4785, 4781, 4721, 3798, 2221, 2317, 2438, 4737, 4775, 283, 222}

$$\frac{c^2d\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2}{x}-\frac{bcd\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))}{3x^2}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2}{3x^3}+\frac{c^3d\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^3}{3b\sqrt{1-c^2x^2}}+\frac{4ic^3d\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2}{3\sqrt{1-c^2x^2}}-\frac{8bc^3d\sqrt{d-c^2dx^2}\,\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{4ib^2c^3d\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(e^{2i\mathrm{ArcSin}(cx)}\right)}{3\sqrt{1-c^2x^2}}-\frac{b^2c^3d\mathrm{ArcSin}(cx)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}-\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d*Sqrt[d - c^2*d*x^2])/x - (b^2*c^3*d*Sqrt[d - c^2*d*x^2]*Arc
Sin[c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2)/x + (((4*I)/3)*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/S
qrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) +
(c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) -
 (8*b*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin
[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((4*I)/3)*b^2*c^3*d*Sqrt[d - c^2*d*x^2]*P
olyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
```

```
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
```

```
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^4}\,dx = -\frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{3x^3} - \left(c^2d\right)\int \frac{\sqrt{d-c^2dx^2}\left(a+b\sin\right.}{x^2}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2} + \frac{c^2d\sqrt{d-c^2dx^2}\,(a}{x}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{bcd\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{3x^2}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x}}{}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x}}{}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x}}{}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x}}{}$$

Mathematica [**A**]
time = 1.25, size = 493, normalized size = 1.23

$$\frac{-abcdx\sqrt{d-c^2dx^2} - a^2d\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2} + 4a^2c^2dx^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2} - b^2c^2dx^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2} + bd\sqrt{d-c^2dx^2}\left(3ac^3x^3+b\left(4ic^3x^3-\sqrt{1-c^2x^2}+4c^2x^2\sqrt{1-c^2x^2}\right)\right)\mathrm{ArcSin}(cx)^2 + b^2c^3dx^3\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)^3 - 3a^2c^3d^{3/2}x^3\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right) - bd\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)\left(bcx+2a(1-4c^2x^2)\sqrt{1-c^2x^2}+8bc^3x^3\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)\right) - 8abc^3dx^3\sqrt{d-c^2dx^2}\,\log(cx) + 4ib^2c^3dx^3\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)}{3x^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (-(a*b*c*d*x*Sqrt[d - c^2*d*x^2]) - a^2*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2] + 4*a^2*c^2*d*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - b^2*c^2*d*x^
2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + b*d*Sqrt[d - c^2*d*x^2]*(3*a*c^3*
x^3 + b*((4*I)*c^3*x^3 - Sqrt[1 - c^2*x^2] + 4*c^2*x^2*Sqrt[1 - c^2*x^2]))*
ArcSin[c*x]^2 + b^2*c^3*d*x^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 3*a^2*c^3
*d^(3/2)*x^3*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-
1 + c^2*x^2))] - b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(b*c*x + 2*a*(1 - 4*c^
2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c^3*x^3*Log[1 - E^((2*I)*ArcSin[c*x])]) - 8*
a*b*c^3*d*x^3*Sqrt[d - c^2*d*x^2]*Log[c*x] + (4*I)*b^2*c^3*d*x^3*Sqrt[d - c
^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*x^3*Sqrt[1 - c^2*x^2])
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3280 vs. 2(372) = 744.
time = 0.46, size = 3281, normalized size = 8.20

method	result	size
default	Expression too large to display	3281

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-
1)*c^8+64*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^
2-1)*arcsin(c*x)*c^8-16*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*arc
sin(c*x)*d*c^3/(3*c^2*x^2-3)+20/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^
4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-104*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4
*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+8*a*b*(-d*(c^2*x^2-1))^(1
/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+4/3*I
*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin
(c*x)*(-c^2*x^2+1)*c^4+32*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*
x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^7-16/3*I*b^2*(-d*
(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*(
-c^2*x^2+1)*c^6-12*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*
x^2/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5+8/3*I*a*b*(-d*(c^2*x^2
-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*c^3+4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^
2*x^2-1)*(-c^2*x^2+1)*c^4-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9
*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*d*c^3-20/3*b^2*(-d*(c^2*x^2-1
))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+29/3*b^2*(-d*(c^2*x
^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-10/3*b^2*(-d*(c
^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+1/3*b^2*(-d*(
c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x/(c^2*x^2-1)*c^2+1/3*b^2*(-d*
(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)^2
-1/3*a^2/d/x^3*(-c^2*d*x^2+d)^(5/2)+2/3*a^2*c^4*x*(-c^2*d*x^2+d)^(3/2)+2/3*
a^2*c^2/d/x*(-c^2*d*x^2+d)^(5/2)+a^2*c^4*d*x*(-c^2*d*x^2+d)^(1/2)+a^2*c^4*d
^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-4/3*I*a*b*(-d
*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+20/3*I*b^2
*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c
*x)*c^6+3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*
x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-
9*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+8*b^2*(-d*(c^
2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^
2*x^2+1)^(1/2)*c^5-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2
+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-16/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c
^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8+4/3*I*b^2*(-d*(c^2*x^2-
1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)
^(1/2)*c^3-8*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4/(c
```

```
^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x
^4-9*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d*c^3-a*b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*d*c^3-
3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x
^2+1)^(1/2)*c^3+8*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(3*c^
2*x^2-3)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+32*b^2*(-d*(c^2*x^2-1))
^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)^2*c^8-52*b^2*
(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*
x)^2*c^6+73/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*
x^2-1)*arcsin(c*x)^2*c^4-14/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^
2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2-3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24
*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+8*b^2*
(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(3*c^2*x^2-3)*arcsin(c*x)*l
n(1+I*c*x+(-c^2*x^2+1)^(1/2))-8*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)*d*c^3/(3*c^2*x^2-3)*arcsin(c*x)^2-8*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)*d*c^3/(3*c^2*x^2-3)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-8*I*
b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*d*c^3/(3*c^2*x^2-3)*polylog(2
,I*c*x+(-c^2*x^2+1)^(1/2))-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9
*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3+4/3*b^2*(-d*(c^2*x^2-1))^(1/
2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+146/3*a*b*(-
d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c
^4-28/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x/(c^2*x^2-1)
*arcsin(c*x)*c^2-24*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)
*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+64*I*a*b*(-d*(c^2*x^2-1
))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*c^7+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^2/(
c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] 1/3*(3*sqrt(-c^2*d*x^2 + d)*c^4*d*x + 3*c^3*d^(3/2)*arcsin(c*x) + 2*(-c^2*d
*x^2 + d)^(3/2)*c^2/x - (-c^2*d*x^2 + d)^(5/2)/(d*x^3))*a^2 - sqrt(d)*integ
rate(((b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
+ 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqr
t(c*x + 1)*sqrt(-c*x + 1)/x^4, x)
```

Fricas [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**4, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^4, x)
```

3.226 $\int x^3(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=651

$$\frac{160b^2d^2\sqrt{d-c^2dx^2}}{3969c^4}+\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{80b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{11907c^4}+\frac{4b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1323c^4}+$$

```
[Out] 5/63*d*x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/9*x^4*(-c^2*d*x^2+d)^
(5/2)*(a+b*arcsin(c*x))^2+160/3969*b^2*d^2*(-c^2*d*x^2+d)^(1/2)/c^4+80/1190
7*b^2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^4+4/1323*b^2*d^2*(-c^2*x^2+1)
^2*(-c^2*d*x^2+d)^(1/2)/c^4+50/27783*b^2*d^2*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^
(1/2)/c^4-2/729*b^2*d^2*(-c^2*x^2+1)^4*(-c^2*d*x^2+d)^(1/2)/c^4-2/63*d^2*(a
+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4-1/63*d^2*x^2*(a+b*arcsin(c*x))^2
*(-c^2*d*x^2+d)^(1/2)/c^2+1/21*d^2*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(
1/2)+4/63*a*b*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/63*b^2*d^
2*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+2/189*b*d^2*x^3
*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/21*b*c*d^2*x
^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+38/441*b*c^3*d
^2*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/81*b*c^5
*d^2*x^9*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.82, antiderivative size = 651, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 18, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}=0.621$, Rules used = {4787, 4783, 4795, 4767, 4715, 267, 4723, 272, 45, 14, 4777, 12, 457, 78, 276, 1265, 911, 1167}

$$-\frac{d^2x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{63c^2}-\frac{2bcd^2x^5\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{21\sqrt{1-c^2x^2}}+\frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2+\frac{2bd^2x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{189c\sqrt{1-c^2x^2}}+\frac{1}{9}x^4(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2+\frac{5}{63}dx^4(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2-\frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{81\sqrt{1-c^2x^2}}-\frac{2d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{63c^4}+\frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{441\sqrt{1-c^2x^2}}+\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{4b^2d^2x\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}-\frac{2b^2d^2(1-c^2x^2)^4\sqrt{d-c^2dx^2}}{729c^4}+\frac{50b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{27783c^4}+\frac{160b^2d^2\sqrt{d-c^2dx^2}}{3969c^4}+\frac{4b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1323c^4}+\frac{80b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{11907c^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (160*b^2*d^2*Sqrt[d - c^2*d*x^2])/(3969*c^4) + (4*a*b*d^2*x*Sqrt[d - c^2*d*
x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (80*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d
*x^2])/(11907*c^4) + (4*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(1323*
c^4) + (50*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(27783*c^4) - (2*b^
2*d^2*(1 - c^2*x^2)^4*Sqrt[d - c^2*d*x^2])/(729*c^4) + (4*b^2*d^2*x*Sqrt[d
- c^2*d*x^2]*ArcSin[c*x])/(63*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d^2*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(189*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*x^
5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(21*Sqrt[1 - c^2*x^2]) + (38*b*c
^3*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(441*Sqrt[1 - c^2*x^2])
 - (2*b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(81*Sqrt[1 - c
^2*x^2]) - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^4) - (d^
2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^2) + (d^2*x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/21 + (5*d*x^4*(d - c^2*d*x^2)^(3/2)*(a
```

```
 + b*ArcSin[c*x])^2)/63 + (x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^3\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{9}(5d)\int x^3\left(d-c^2dx^2\right)^{3}$$

$$=-\frac{2bcd^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{45\sqrt{1-c^2x^2}}+\frac{4bc^3d^2x^7\sqrt{d-c^2dx^2}}{63\sqrt{1-c}}$$

$$=-\frac{8bcd^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{105\sqrt{1-c^2x^2}}+\frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-}}$$

$$=-\frac{2bcd^2x^5\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{21\sqrt{1-c^2x^2}}+\frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-}}$$

$$=\frac{2bd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{189c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^5\sqrt{d-c^2dx^2}\,(a+}{21\sqrt{1-c^2x^2}}$$

$$=\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{2bd^2x^3\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{189c\sqrt{1-c^2x^2}}-\frac{2b}{}$$

$$=-\frac{134b^2d^2\sqrt{d-c^2dx^2}}{3969c^4}+\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{122b^2d^2(1-c^2x}{1190}$$

$$=\frac{160b^2d^2\sqrt{d-c^2dx^2}}{3969c^4}+\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{80b^2d^2(1-c^2x^2)}{11907c}$$

Mathematica [A]
time = 0.25, size = 270, normalized size = 0.41

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(3969a^2(1-c^2x^2)^{7/2}(2+7c^2x^2)+126abcx(-126-21c^2x^2+189c^4x^4-171c^6x^6+49c^8x^8)+2b^2\sqrt{1-c^2x^2}(-6140+899c^2x^2+1005c^4x^4-1147c^6x^6+343c^8x^8)+126b\left(63a(1-c^2x^2)^{7/2}(2+7c^2x^2)+bcx(-126-21c^2x^2+189c^4x^4-171c^6x^6+49c^8x^8)\right)\text{ArcSin}(cx)+3969b^2(1-c^2x^2)^{7/2}(2+7c^2x^2)\text{ArcSin}(cx)^2\right)}{250047c^4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/250047*(d^2*Sqrt[d - c^2*d*x^2]*(3969*a^2*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2
*x^2) + 126*a*b*c*x*(-126 - 21*c^2*x^2 + 189*c^4*x^4 - 171*c^6*x^6 + 49*c^8
*x^8) + 2*b^2*Sqrt[1 - c^2*x^2]*(-6140 + 899*c^2*x^2 + 1005*c^4*x^4 - 1147*
c^6*x^6 + 343*c^8*x^8) + 126*b*(63*a*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2) +
b*c*x*(-126 - 21*c^2*x^2 + 189*c^4*x^4 - 171*c^6*x^6 + 49*c^8*x^8))*ArcSin[
c*x] + 3969*b^2*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2)*ArcSin[c*x]^2))/(c^4*Sq
rt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.44, size = 2146, normalized size = 3.30

method	result	size
default	Expression too large to display	2146

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] a^2*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2))+b^2*(1/373248*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(18*I*arcsin(c*x)+81*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)-3/175616*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)+1/1728*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)+1/1728*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)-3/175616*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)+1/373248*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-18*I*arcsin(c*x)+81*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1))+2*a*b*(1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^4/(c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c

```
^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^4/(
c^2*x^2-1)-3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+
64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arc
sin(c*x))*d^2/c^4/(c^2*x^2-1)+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x
^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*
x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x
^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*
x))*d^2/c^4/(c^2*x^2-1))
```

Maxima [A]
time = 0.51, size = 401, normalized size = 0.62

$$-\frac{1}{63}\left(\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^4d}\right)b^2\arcsin\left(cx\right)^2-\frac{2}{63}\left(\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^4d}\right)ab\arcsin\left(cx\right)-\frac{1}{63}\left(\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^4d}\right)a^2-\frac{2}{250047}b^2\left(\frac{343\sqrt{-c^2x^2+1}\,c^6d^{\frac{5}{2}}x^8-1147\sqrt{-c^2x^2+1}\,c^4d^{\frac{5}{2}}x^6+1005\sqrt{-c^2x^2+1}\,c^2d^{\frac{5}{2}}x^4+899\sqrt{-c^2x^2+1}\,d^{\frac{5}{2}}x^2-\frac{6140\sqrt{-c^2x^2+1}\,d^{\frac{5}{2}}}{c^2}}{c^2}+\frac{63\left(49\,c^8d^{\frac{5}{2}}x^9-171\,c^6d^{\frac{5}{2}}x^7+189\,c^4d^{\frac{5}{2}}x^5-21\,c^2d^{\frac{5}{2}}x^3-126\,d^{\frac{5}{2}}x\right)\arcsin\left(cx\right)}{c^3}\right)-\frac{2\left(49\,c^8d^{\frac{5}{2}}x^9-171\,c^6d^{\frac{5}{2}}x^7+189\,c^4d^{\frac{5}{2}}x^5-21\,c^2d^{\frac{5}{2}}x^3-126\,d^{\frac{5}{2}}x\right)ab}{3969\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(7/2)/(c^4
*d))*b^2*arcsin(c*x)^2 - 2/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c
^2*d*x^2 + d)^(7/2)/(c^4*d))*a*b*arcsin(c*x) - 1/63*(7*(-c^2*d*x^2 + d)^(7/
2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(7/2)/(c^4*d))*a^2 - 2/250047*b^2*((343
*sqrt(-c^2*x^2 + 1)*c^6*d^(5/2)*x^8 - 1147*sqrt(-c^2*x^2 + 1)*c^4*d^(5/2)*x
^6 + 1005*sqrt(-c^2*x^2 + 1)*c^2*d^(5/2)*x^4 + 899*sqrt(-c^2*x^2 + 1)*d^(5/
2)*x^2 - 6140*sqrt(-c^2*x^2 + 1)*d^(5/2)/c^2)/c^2 + 63*(49*c^8*d^(5/2)*x^9
- 171*c^6*d^(5/2)*x^7 + 189*c^4*d^(5/2)*x^5 - 21*c^2*d^(5/2)*x^3 - 126*d^(5
/2)*x)*arcsin(c*x)/c^3) - 2/3969*(49*c^8*d^(5/2)*x^9 - 171*c^6*d^(5/2)*x^7
+ 189*c^4*d^(5/2)*x^5 - 21*c^2*d^(5/2)*x^3 - 126*d^(5/2)*x)*a*b/c^3
```

Fricas [A]
time = 2.23, size = 486, normalized size = 0.75

$$\frac{126\left(49\,abc^9d^2x^9-171\,abc^7d^2x^7+189\,abc^5d^2x^5-21\,abc^3d^2x^3-126\,abcd^2x+\left(49\,b^2c^9d^2x^9-171\,b^2c^7d^2x^7+189\,b^2c^5d^2x^5-21\,b^2c^3d^2x^3-126\,b^2cd^2x\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+\left(343\left(81\,a^2-2\,b^2\right)c^{10}d^2x^{10}-2\left(51597\,a^2-1490\,b^2\right)c^8d^2x^8+2\left(67473\,a^2-2152\,b^2\right)c^6d^2x^6-4\left(15876\,a^2-53\,b^2\right)c^4d^2x^4-\left(3969\,a^2-14078\,b^2\right)c^2d^2x^2+2\left(3969\,a^2-6140\,b^2\right)d^2+3969\left(7\,b^2c^{10}d^2x^{10}-26\,b^2c^8d^2x^8+34\,b^2c^6d^2x^6-16\,b^2c^4d^2x^4-b^2c^2d^2x^2+2\,b^2d^2\right)\arcsin\left(cx\right)^2+7938\left(7\,abc^{10}d^2x^{10}-26\,abc^8d^2x^8+34\,abc^6d^2x^6-16\,abc^4d^2x^4-abc^2d^2x^2+2\,abd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{250047\left(c^6x^2-c^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] 1/250047*(126*(49*a*b*c^9*d^2*x^9 - 171*a*b*c^7*d^2*x^7 + 189*a*b*c^5*d^2*x
^5 - 21*a*b*c^3*d^2*x^3 - 126*a*b*c*d^2*x + (49*b^2*c^9*d^2*x^9 - 171*b^2*c
^7*d^2*x^7 + 189*b^2*c^5*d^2*x^5 - 21*b^2*c^3*d^2*x^3 - 126*b^2*c*d^2*x)*ar
csin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + (343*(81*a^2 - 2*b^2)*
c^10*d^2*x^10 - 2*(51597*a^2 - 1490*b^2)*c^8*d^2*x^8 + 2*(67473*a^2 - 2152*
b^2)*c^6*d^2*x^6 - 4*(15876*a^2 - 53*b^2)*c^4*d^2*x^4 - (3969*a^2 - 14078*b
^2)*c^2*d^2*x^2 + 2*(3969*a^2 - 6140*b^2)*d^2 + 3969*(7*b^2*c^10*d^2*x^10 -
```

```
26*b^2*c^8*d^2*x^8 + 34*b^2*c^6*d^2*x^6 - 16*b^2*c^4*d^2*x^4 - b^2*c^2*d^2
*x^2 + 2*b^2*d^2)*arcsin(c*x)^2 + 7938*(7*a*b*c^10*d^2*x^10 - 26*a*b*c^8*d^
2*x^8 + 34*a*b*c^6*d^2*x^6 - 16*a*b*c^4*d^2*x^4 - a*b*c^2*d^2*x^2 + 2*a*b*d
^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
[Out] Exception raised: SystemError >> excessive stack use: stack is 3876 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.227 $\int x^2(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=556

$$-\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2}-\frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296}+\frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824}-\frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2}+359$$

```
[Out] 5/48*d*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/8*x^3*(-c^2*d*x^2+d)^
(5/2)*(a+b*arcsin(c*x))^2-359/36864*b^2*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-1079
/55296*b^2*d^2*x^3*(-c^2*d*x^2+d)^(1/2)+209/13824*b^2*c^2*d^2*x^5*(-c^2*d*x
^2+d)^(1/2)-1/256*b^2*c^4*d^2*x^7*(-c^2*d*x^2+d)^(1/2)-5/128*d^2*x*(a+b*arc
sin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+5/64*d^2*x^3*(a+b*arcsin(c*x))^2*(-c^2
*d*x^2+d)^(1/2)+359/36864*b^2*d^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^
2*x^2+1)^(1/2)+5/128*b*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c
^2*x^2+1)^(1/2)-59/384*b*c*d^2*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+17/144*b*c^3*d^2*x^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-1/32*b*c^5*d^2*x^8*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)+5/384*d^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/
b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.70, antiderivative size = 556, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 14, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.483$, Rules used = {4787, 4783, 4795, 4737, 4723, 327, 222, 14, 4777, 12, 470, 272, 45, 1281}

$$\frac{5bd^2x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{128c\sqrt{1-c^2x^2}}-\frac{5d^2x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{128c^2}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{384\sqrt{1-c^2x^2}}+\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2+\frac{1}{8}x^3(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2+\frac{5}{48}dx^3(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{32\sqrt{1-c^2x^2}}+\frac{5d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^3}{384bc^3\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{144\sqrt{1-c^2x^2}}+\frac{359b^2d^2\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{36864c^3\sqrt{1-c^2x^2}}-\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2}+\frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824}-\frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296}-\frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-359*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/(36864*c^2) - (1079*b^2*d^2*x^3*Sqrt[d
 - c^2*d*x^2])/55296 + (209*b^2*c^2*d^2*x^5*Sqrt[d - c^2*d*x^2])/13824 - (b
^2*c^4*d^2*x^7*Sqrt[d - c^2*d*x^2])/256 + (359*b^2*d^2*Sqrt[d - c^2*d*x^2]*
ArcSin[c*x])/(36864*c^3*Sqrt[1 - c^2*x^2]) + (5*b*d^2*x^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/(128*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(384*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x
^6*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(144*Sqrt[1 - c^2*x^2]) - (b*c^
5*d^2*x^8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(32*Sqrt[1 - c^2*x^2]) -
 (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(128*c^2) + (5*d^2*x^3
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/64 + (5*d*x^3*(d - c^2*d*x^2)^(
3/2)*(a + b*ArcSin[c*x])^2)/48 + (x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2)/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(384*b*c^3*Sq
rt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
```

```
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
```

```
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{8}(5d)\int x^2\left(d-c^2dx^2\right)$$

$$=-\frac{bcd^2x^4\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{16\sqrt{1-c^2x^2}}+\frac{bc^3d^2x^6\sqrt{d-c^2dx^2}\,(}{12\sqrt{1-c}}$$

$$=-\frac{11bcd^2x^4\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{96\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2d}}{144\sqrt{1}}$$

$$=-\frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}\,(a+b\sin^{-}}{384\sqrt{1-c^2x^2}}$$

$$=-\frac{5}{512}b^2d^2x^3\sqrt{d-c^2dx^2}+\frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824}-\frac{1}{256}b^2c$$

$$=\frac{5b^2d^2x\sqrt{d-c^2dx^2}}{1024c^2}-\frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296}+\frac{209b^2c^2d^2x^5}{138}$$

$$=-\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2}-\frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296}+\frac{209b^2c^2d}{}$$

$$=-\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2}-\frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296}+\frac{209b^2c^2d}{}$$

Mathematica [A]
time = 0.27, size = 348, normalized size = 0.63

$$\frac{d^2\sqrt{d-c^2dx^2}\left(1440a^3-96ab^2c^2x^2(-45+177c^2x^2-136c^4x^4+36c^6x^6)+288a^2bcx\sqrt{1-c^2x^2}\,(-15+118c^2x^2-136c^4x^4+48c^6x^6)-b^3cx\sqrt{1-c^2x^2}\,(1077+2158c^2x^2-1672c^4x^4+432c^6x^6)+3b\left(1440a^2+192abcx\sqrt{1-c^2x^2}\,(-15+118c^2x^2-136c^4x^4+48c^6x^6)+b^2(359+1440c^2x^2-5664c^4x^4+4352c^6x^6-1152c^8x^8)\right)\mathrm{ArcSin}(cx)+288b^2\left(15a+bcx\sqrt{1-c^2x^2}\,(-15+118c^2x^2-136c^4x^4+48c^6x^6)\right)\mathrm{ArcSin}(cx)^2+1440b^3\mathrm{ArcSin}(cx)^3\right)}{110592bc^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(1440*a^3 - 96*a*b^2*c^2*x^2*(-45 + 177*c^2*x^2 -
136*c^4*x^4 + 36*c^6*x^6) + 288*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*
x^2 - 136*c^4*x^4 + 48*c^6*x^6) - b^3*c*x*Sqrt[1 - c^2*x^2]*(1077 + 2158*c^
2*x^2 - 1672*c^4*x^4 + 432*c^6*x^6) + 3*b*(1440*a^2 + 192*a*b*c*x*Sqrt[1 -
c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6) + b^2*(359 + 1440*c
^2*x^2 - 5664*c^4*x^4 + 4352*c^6*x^6 - 1152*c^8*x^8))*ArcSin[c*x] + 288*b^2
*(15*a + b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*
x^6))*ArcSin[c*x]^2 + 1440*b^3*ArcSin[c*x]^3))/(110592*b*c^3*Sqrt[1 - c^2*x
^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.58, size = 1939, normalized size = 3.49

method	result	size
default	Expression too large to display	1939

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*a^2*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/48*a^2/c^2*x*(-c^2*d*x^2+d)^(5/2)+5
/192*a^2/c^2*d*x*(-c^2*d*x^2+d)^(3/2)+5/128*a^2/c^2*d^2*x*(-c^2*d*x^2+d)^(1
/2)+5/128*a^2/c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(
1/2))+b^2*(-5/384*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)
*arcsin(c*x)^3*d^2+1/65536*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2
)*x^8*c^8+128*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-
c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-88*c^3
*x^3-I*(-c^2*x^2+1)^(1/2)+8*c*x)*(8*I*arcsin(c*x)+32*arcsin(c*x)^2-1)*d^2/c
^3/(c^2*x^2-1)-1/6912*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*x^6*
c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(6*I*arcsin(c*x)+18*a
rcsin(c*x)^2-1)*d^2/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2
*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*
x)+2*arcsin(c*x)^2-1)*d^2/c^3/(c^2*x^2-1)+1/65536*(-d*(c^2*x^2-1))^(1/2)*(1
28*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^
6-320*c^7*x^7+160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1
)^(1/2)*x^2*c^2-88*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+8*c*x)*(-8*I*arcsin(c*x)+32
*arcsin(c*x)^2-1)*d^2/c^3/(c^2*x^2-1)+1/55296*(-d*(c^2*x^2-1))^(1/2)*(I*x^2
*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(156*I*arcsin(c*x)+72*arcsin(c*x)^2-19)*cos(
5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-5/55296*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*(12*I*arcsin(c*x)+72*arcsin(c*x)^2-7)*sin(5*arc
sin(c*x))*d^2/c^3/(c^2*x^2-1)-3/2048*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*
(-c^2*x^2+1)^(1/2)-I)*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-3)*cos(3*arcsin(c*x)
```

```
)*d^2/c^3/(c^2*x^2-1)+1/2048*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x
*c+c^2*x^2-1)*(20*I*arcsin(c*x)+8*arcsin(c*x)^2-7)*sin(3*arcsin(c*x))*d^2/c
^3/(c^2*x^2-1))+2*a*b*(-5/256*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3
/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2
*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*
x^7-160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*x^
2*c^2-88*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+8*c*x)*(I+8*arcsin(c*x))*d^2/c^3/(c^2
*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*
x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/14
7456*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(73*I+312*
arcsin(c*x))*cos(7*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-1/147456*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(55*I+456*arcsin(c*x))*sin(7*
arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/9216*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c
*x*(-c^2*x^2+1)^(1/2)-I)*(13*I+12*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c^3/(
c^2*x^2-1)-5/9216*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*(I+12*arcsin(c*x))*sin(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/1024*(-d*(c^
2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(I+4*arcsin(c*x))*cos(
3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x
^2+1)^(1/2)*x*c+c^2*x^2-1)*(5*I+4*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c^3/(
c^2*x^2-1))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] 1/384*(8*(-c^2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d)
 + 10*(-c^2*d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 +
15*d^(5/2)*arcsin(c*x)/c^3)*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^6 - 2*b
^2*c^2*d^2*x^4 + b^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
+ 2*(a*b*c^4*d^2*x^6 - 2*a*b*c^2*d^2*x^4 + a*b*d^2*x^2)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^6 - 2*a^2*c^2*d^2*x^4 + a^2*d^2*x^2 + (b^2*c^4*d^2*
x^6 - 2*b^2*c^2*d^2*x^4 + b^2*d^2*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^6 -
 2*a*b*c^2*d^2*x^4 + a*b*d^2*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3060 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(d-c^2\,d\,x^2\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.228 $\int x(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=382

$$\frac{32b^2d^2\sqrt{d-c^2dx^2}}{245c^2}+\frac{16b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2}+\frac{12b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2}+\frac{2b^2d^2(1-c^2x^2)^3\sqrt{d}}{343c^2}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))^2/c^2/d+32/245*b^2*d^2*(-c^2*d*
x^2+d)^(1/2)/c^2+16/735*b^2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+12/12
25*b^2*d^2*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+2/343*b^2*d^2*(-c^2*x^2+
1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+2/7*b*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-2/7*b*c*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)
^(1/2)/(-c^2*x^2+1)^(1/2)+6/35*b*c^3*d^2*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/49*b*c^5*d^2*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 382, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}=0.222$, Rules used = {4767, 200, 4739, 12, 1813, 1864}

$$\frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{7c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{7\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{7/2}(a+b\text{ArcSin}(cx))^2}{7c^2d}-\frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{49\sqrt{1-c^2x^2}}+\frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{35\sqrt{1-c^2x^2}}+\frac{2b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2}+\frac{32b^2d^2\sqrt{d-c^2dx^2}}{245c^2}+\frac{12b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2}+\frac{16b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d^2*Sqrt[d - c^2*d*x^2])/(245*c^2) + (16*b^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(735*c^2) + (12*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2
])/(1225*c^2) + (2*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^2) +
 (2*b*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c*Sqrt[1 - c^2*x^2]
) - (2*b*c*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*Sqrt[1 - c^2
*x^2]) + (6*b*c^3*d^2*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(35*Sqrt
[1 - c^2*x^2]) - (2*b*c^5*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
(49*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x])^2)/(7*c
^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = -\frac{\left(d-c^2dx^2\right)^{7/2}\left(a+b\sin^{-1}(cx)\right)^2}{7c^2d} + \frac{\left(2bd^2\sqrt{d-c^2dx^2}\right)\int(1 -}{7c\sqrt{1}}$$

$$= \frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}\,(a+}{7\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}\,(a+}{7\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}\,(a+}{7\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}\,(a+}{7\sqrt{1-c^2x^2}}$$

$$= \frac{32b^2d^2\sqrt{d-c^2dx^2}}{245c^2} + \frac{16b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2} + \frac{12b^2d^2(}{}$$

Mathematica [A]
time = 0.21, size = 226, normalized size = 0.59

$$\frac{d^2\sqrt{d-c^2dx^2}\left(3675a^2(-1+c^2x^2)^4+210abcx\sqrt{1-c^2x^2}\,(-35+35c^2x^2-21c^4x^4+5c^6x^6)-2b^2(2161-2918c^2x^2+1108c^4x^4-426c^6x^6+75c^8x^8)+210b\left(35a(-1+c^2x^2)^4+bcx\sqrt{1-c^2x^2}\,(-35+35c^2x^2-21c^4x^4+5c^6x^6)\right)\mathrm{ArcSin}(cx)+3675b^2(-1+c^2x^2)^4\,\mathrm{ArcSin}(cx)^2\right)}{25725c^2\,(-1+c^2x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(3675*a^2*(-1 + c^2*x^2)^4 + 210*a*b*c*x*Sqrt[1 -
c^2*x^2]*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) - 2*b^2*(2161 - 2918*c
^2*x^2 + 1108*c^4*x^4 - 426*c^6*x^6 + 75*c^8*x^8) + 210*b*(35*a*(-1 + c^2*x
^2)^4 + b*c*x*Sqrt[1 - c^2*x^2]*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6)
)*ArcSin[c*x] + 3675*b^2*(-1 + c^2*x^2)^4*ArcSin[c*x]^2))/(25725*c^2*(-1 +
c^2*x^2))
```

Maple [C] Result contains complex when optimal does not.
time = 0.32, size = 1611, normalized size = 4.22

method	result	size
default	Expression too large to display	1611

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/7*a^2/c^2/d*(-c^2*d*x^2+d)^(7/2)+b^2*(1/43904*(-d*(c^2*x^2-1))^(1/2)*(64
*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7+104*c^4*x^4+112*I*(-c^
2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2
*x^2+1)^(1/2)*x*c+1)*(14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2
-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(
1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-5/128
*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2
-2+2*I*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c
^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c^2/(c
^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^
4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*
x)^2-2)*d^2/c^2/(c^2*x^2-1)+1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*I*(-c^2*x^2+
1)^(1/2)*x^7*c^7+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2
*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/2400*(
-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(30*I*arcsin(c*x
)+75*arcsin(c*x)^2-14)*cos(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/4800*(-d*(c
^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(90*I*arcsin(c*x)+75*
arcsin(c*x)^2-22)*sin(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1))+2*a*b*(1/6272*(-d
*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*(-c^2*x^2+1)^(1/2)*x^7*c^7
+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^
(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^2/(c^2*
x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(a
rcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+1/128*(-d*(c^2
*x^2-1))^(1/2)*(4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+4*c^4*x^4-3*I*(-c^2*x^2+1)^(
1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/7840*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+70*arcsin(c*x))*
cos(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-3/15680*(-d*(c^2*x^2-1))^(1/2)*(I*x^
2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(9*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2
/c^2/(c^2*x^2-1)-1/160*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2
*x^2-1)*(I+5*arcsin(c*x))*cos(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/320*(-d*
(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(3*I+5*arcsin(c*x))
*sin(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1))
```

Maxima [A]

time = 0.51, size = 281, normalized size = 0.74

$$-\frac{(-c^2dx^2+d)^{\frac{7}{2}}b^2\arcsin(cx)^2}{7\,c^2d}-\frac{2\,(-c^2dx^2+d)^{\frac{7}{2}}ab\arcsin(cx)}{7\,c^2d}-\frac{2}{25725}\,b^2\left(\frac{75\,\sqrt{-c^2x^2+1}\,c^4d^{\frac{7}{2}}x^6-351\,\sqrt{-c^2x^2+1}\,c^2d^{\frac{7}{2}}x^4+757\,\sqrt{-c^2x^2+1}\,d^{\frac{7}{2}}x^2-\frac{2161\,\sqrt{-c^2x^2+1}\,d^{\frac{7}{2}}}{c^2}}{d}+\frac{105\left(5\,c^6d^{\frac{7}{2}}x^7-21\,c^4d^{\frac{7}{2}}x^5+35\,c^2d^{\frac{7}{2}}x^3-35\,d^{\frac{7}{2}}x\right)\arcsin(cx)}{cd}\right)-\frac{(-c^2dx^2+d)^{\frac{7}{2}}a^2}{7\,c^2d}-\frac{2\left(5\,c^6d^{\frac{7}{2}}x^7-21\,c^4d^{\frac{7}{2}}x^5+35\,c^2d^{\frac{7}{2}}x^3-35\,d^{\frac{7}{2}}x\right)ab}{245\,cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*(-c^2*d*x^2 + d)^(7/2)*b^2*arcsin(c*x)^2/(c^2*d) - 2/7*(-c^2*d*x^2 + d
)^(7/2)*a*b*arcsin(c*x)/(c^2*d) - 2/25725*b^2*((75*sqrt(-c^2*x^2 + 1)*c^4*d
```

```
^(7/2)*x^6 - 351*sqrt(-c^2*x^2 + 1)*c^2*d^(7/2)*x^4 + 757*sqrt(-c^2*x^2 + 1
)*d^(7/2)*x^2 - 2161*sqrt(-c^2*x^2 + 1)*d^(7/2)/c^2)/d + 105*(5*c^6*d^(7/2)
*x^7 - 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7/2)*x^3 - 35*d^(7/2)*x)*arcsin(c*x)/
(c*d)) - 1/7*(-c^2*d*x^2 + d)^(7/2)*a^2/(c^2*d) - 2/245*(5*c^6*d^(7/2)*x^7
- 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7/2)*x^3 - 35*d^(7/2)*x)*a*b/(c*d)
```

Fricas [A]
time = 1.82, size = 405, normalized size = 1.06

$$\frac{210\,\left(5\,abc^7d^2x^7-21\,abc^5d^2x^5+35\,abc^3d^2x^3-35\,abcd^2x+\left(5\,b^2c^7d^2x^7-21\,b^2c^5d^2x^5+35\,b^2c^3d^2x^3-35\,b^2cd^2x\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+\left(75\,\left(49\,a^2-2\,b^2\right)c^8d^2x^8-12\,\left(1225\,a^2-71\,b^2\right)c^6d^2x^6+2\,\left(11025\,a^2-1108\,b^2\right)c^4d^2x^4-4\,\left(3675\,a^2-1459\,b^2\right)c^2d^2x^2+\left(3675\,a^2-4322\,b^2\right)d^2+3675\,\left(b^2c^8d^2x^8-4\,b^2c^6d^2x^6+6\,b^2c^4d^2x^4-4\,b^2c^2d^2x^2+b^2d^2\right)\arcsin\left(cx\right)^2+7350\,\left(abc^8d^2x^8-4\,abc^6d^2x^6+6\,abc^4d^2x^4-4\,abc^2d^2x^2+abd^2\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}}{25725\,\left(c^4x^2-c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/25725*(210*(5*a*b*c^7*d^2*x^7 - 21*a*b*c^5*d^2*x^5 + 35*a*b*c^3*d^2*x^3 -
 35*a*b*c*d^2*x + (5*b^2*c^7*d^2*x^7 - 21*b^2*c^5*d^2*x^5 + 35*b^2*c^3*d^2*
x^3 - 35*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)
+ (75*(49*a^2 - 2*b^2)*c^8*d^2*x^8 - 12*(1225*a^2 - 71*b^2)*c^6*d^2*x^6 + 2
*(11025*a^2 - 1108*b^2)*c^4*d^2*x^4 - 4*(3675*a^2 - 1459*b^2)*c^2*d^2*x^2 +
 (3675*a^2 - 4322*b^2)*d^2 + 3675*(b^2*c^8*d^2*x^8 - 4*b^2*c^6*d^2*x^6 + 6*
b^2*c^4*d^2*x^4 - 4*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 7350*(a*b*c^
8*d^2*x^8 - 4*a*b*c^6*d^2*x^6 + 6*a*b*c^4*d^2*x^4 - 4*a*b*c^2*d^2*x^2 + a*b
*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*(-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.229 $\int (d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=438

$$-\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}-\frac{65b^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x(1-c^2x^2)^2\sqrt{d-c^2dx^2}+\frac{115b^2d^2\sqrt{d}}{1152}$$

```
[Out] 5/24*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/6*x*(-c^2*d*x^2+d)^(5/2
)*(a+b*arcsin(c*x))^2-245/1152*b^2*d^2*x*(-c^2*d*x^2+d)^(1/2)-65/1728*b^2*d
^2*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-1/108*b^2*d^2*x*(-c^2*x^2+1)^2*(-c^2
*d*x^2+d)^(1/2)+5/48*b*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c+1/18*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/c+5/16*d^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+115/1152*b^2*d^
2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-5/16*b*c*d^2*x^2*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/48*d^2*(a+b*arcsi
n(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.27, antiderivative size = 438, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\frac{5d^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^3}{48bc\sqrt{1-c^2x^2}}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2+\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{18c}+\frac{5bd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{48c}-\frac{5bcd^2x^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{16\sqrt{1-c^2x^2}}+\frac{1}{6}x(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2+\frac{5}{24}dx(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2+\frac{115b^2d^2\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{1152c\sqrt{1-c^2x^2}}-\frac{1}{108}b^2d^2x(1-c^2x^2)^2\sqrt{d-c^2dx^2}-\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}-\frac{65b^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-245*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/1152 - (65*b^2*d^2*x*(1 - c^2*x^2)*Sqr
t[d - c^2*d*x^2])/1728 - (b^2*d^2*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/10
8 + (115*b^2*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(1152*c*Sqrt[1 - c^2*x^2]
) - (5*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*Sqrt[1 - c^
2*x^2]) + (5*b*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(48*c) + (b*d^2*(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(18*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/16 + (5
*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/24 + (x*(d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^3)/(48*b*c*Sqrt[1 - c^2*x^2])
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{6}(5d)\int \left(d-c^2dx^2\right)^{3/2}(a$$

$$=\frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)}{18c}+\frac{5}{24}dx\left(d-c^2dx^2\right.$$

$$=-\frac{1}{108}b^2d^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}+\frac{5bd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2}}{48c}$$

$$=-\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x\left(1-c^2x^2\right)^2\sqrt{d-c}$$

$$=-\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}-\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}$$

$$=-\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}-\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}$$

Mathematica [A]
time = 1.19, size = 407, normalized size = 0.93

$$\frac{d^2\left(1440b^2\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)^3-4320a^2\sqrt{d}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\left(-1+c^2x^2\right)}\right)+12b\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)\left(270b\cos(2\text{ArcSin}(cx))+27b\cos(4\text{ArcSin}(cx))+2b\cos(6\text{ArcSin}(cx))+540a\sin(2\text{ArcSin}(cx))+108a\sin(4\text{ArcSin}(cx))+12a\sin(6\text{ArcSin}(cx))\right)+72b\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)^2\left(60a+45b\sin(2\text{ArcSin}(cx))+9b\sin(4\text{ArcSin}(cx))+b\sin(6\text{ArcSin}(cx))\right)+\sqrt{d-c^2dx^2}\left(9504a^2cx\sqrt{1-c^2x^2}-7488a^2c^3x^3\sqrt{1-c^2x^2}+2304a^2c^5x^5\sqrt{1-c^2x^2}+3240ab\cos(2\text{ArcSin}(cx))+324ab\cos(4\text{ArcSin}(cx))+24ab\cos(6\text{ArcSin}(cx))-1620b^2\sin(2\text{ArcSin}(cx))-81b^2\sin(4\text{ArcSin}(cx))-4b^2\sin(6\text{ArcSin}(cx))\right)\right)}{13824c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(1440*b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 4320*a^2*Sqrt[d]*Sqrt[1
- c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 12*
b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*Ar
cSin[c*x]] + 2*b*Cos[6*ArcSin[c*x]] + 540*a*Sin[2*ArcSin[c*x]] + 108*a*Sin[
4*ArcSin[c*x]] + 12*a*Sin[6*ArcSin[c*x]]) + 72*b*Sqrt[d - c^2*d*x^2]*ArcSin
[c*x]^2*(60*a + 45*b*Sin[2*ArcSin[c*x]] + 9*b*Sin[4*ArcSin[c*x]] + b*Sin[6*
ArcSin[c*x]]) + Sqrt[d - c^2*d*x^2]*(9504*a^2*c*x*Sqrt[1 - c^2*x^2] - 7488*
a^2*c^3*x^3*Sqrt[1 - c^2*x^2] + 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] + 3240*a
```

```
*b*Cos[2*ArcSin[c*x]] + 324*a*b*Cos[4*ArcSin[c*x]] + 24*a*b*Cos[6*ArcSin[c*
x]] - 1620*b^2*Sin[2*ArcSin[c*x]] - 81*b^2*Sin[4*ArcSin[c*x]] - 4*b^2*Sin[6
*ArcSin[c*x]])))/(13824*c*Sqrt[1 - c^2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.22, size = 1349, normalized size = 3.08

method	result	size
default	Expression too large to display	1349

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*x*(-c^2*d*x^2+d)^(5/2)*a^2+5/24*a^2*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a^2*d
^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))+b^2*(-5/48*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/c/(c^2*x^2-1)*arcsin(c*x)^3*d^2+1/6912*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2
*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5
-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(6*
I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))
^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x
)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1)-1/27648*(-d*(c^2*x
^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(348*I*arcsin(c*x)+576*ar
csin(c*x)^2-77)*cos(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)+5/27648*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(60*I*arcsin(c*x)+144*arcsin(
c*x)^2-17)*sin(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/
2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(44*I*arcsin(c*x)+32*arcsin(c*x)^2-
19)*cos(3*arcsin(c*x))*d^2/c/(c^2*x^2-1)+9/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(
-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(12*I*arcsin(c*x)+16*arcsin(c*x)^2-7)*sin(
3*arcsin(c*x))*d^2/c/(c^2*x^2-1))+2*a*b*(-5/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/2304*(-d*(c^2*x^2-1))^(1/2)
*(-32*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c
^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/
2)-6*c*x)*(I+6*arcsin(c*x))*d^2/c/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)
*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+
2*arcsin(c*x))*d^2/c/(c^2*x^2-1)-1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*x^2*c^2-c
*x*(-c^2*x^2+1)^(1/2)-I)*(29*I+96*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c/(c^
2*x^2-1)+5/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)
*(5*I+24*arcsin(c*x))*sin(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-3/512*(-d*(c^2*x
^2-1))^(1/2)*(I*x^2*c^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+16*arcsin(c*x))*cos
(3*arcsin(c*x))*d^2/c/(c^2*x^2-1)+9/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(3*I+8*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c/(c^2*
x^2-1))
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2 + sqrt(d)*integrate((
(b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \left(-d(cx-1)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\operatorname{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.230 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=687

$$-\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2}-\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{74}{675}b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}-\frac{2}{125}b^2d^2(1-c^2x^2)^2\sqrt{d-$$

```
[Out] 1/3*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/5*(-c^2*d*x^2+d)^(5/2)*(a+
b*arcsin(c*x))^2-598/225*b^2*d^2*(-c^2*d*x^2+d)^(1/2)-74/675*b^2*d^2*(-c^2*
x^2+1)*(-c^2*d*x^2+d)^(1/2)-2/125*b^2*d^2*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/
2)+d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-2*a*b*c*d^2*x*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*c*d^2*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)-16/15*b*c*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-
c^2*x^2+1)^(1/2)+22/45*b*c^3*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)
/(-c^2*x^2+1)^(1/2)-2/25*b*c^5*d^2*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-2*d^2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^
(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*I*b*d^2*(a+b*arcsin(c*x))*
polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
+2*I*b*d^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*d^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*d^2*polylog(3,I*c*x+(-c^2*
x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.62, antiderivative size = 687, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 16, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.552, Rules used = {4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45, 200, 12, 1261, 712}

$$\frac{2ibd^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2ibd^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{15\sqrt{1-c^2x^2}}+d^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2-\frac{2d^2\sqrt{d-c^2dx^2}\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+\frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2+\frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2-\frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{25\sqrt{1-c^2x^2}}+\frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{45\sqrt{1-c^2x^2}}-\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2d^2\sqrt{d-c^2dx^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{2b^2d^2\sqrt{d-c^2dx^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2cd^2x\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2}-\frac{2}{125}b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}-\frac{74}{675}b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (-598*b^2*d^2*Sqrt[d - c^2*d*x^2])/225 - (2*a*b*c*d^2*x*Sqrt[d - c^2*d*x^2]
)/Sqrt[1 - c^2*x^2] - (74*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/675 -
(2*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/125 - (2*b^2*c*d^2*x*Sqrt[d
 - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (16*b*c*d^2*x*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^2]) + (22*b*c^3*d^2*x^3*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*Sqrt[1 - c^2*x^2]) - (2*b*c^5*d^2*x
^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) + d^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 + (d*(d - c^2*d*x^2)^(3/2)*(a + b*A
rcSin[c*x])^2)/3 + ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/5 - (2*d^2
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt
```

```
[1 - c^2*x^2] + ((2*I)*b*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLo
g[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] -
(2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] + (2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[
1 - c^2*x^2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
```

```
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{x}dx = \frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2 + d\int \frac{(d-c^2dx^2)^{3/2}(a+b\sin$$

$$= -\frac{2bcd^2x\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{5\sqrt{1-c^2x^2}} + \frac{4bc^3d^2x^3\sqrt{d-c^2dx^2}(a}{15\sqrt{1-c^2x}}$$

$$= -\frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2}}$$

$$= -\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\sin^{-1}(cx))}{15\sqrt{1-c^2x^2}} +$$

$$= -\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cd^2x\sqrt{d-c^2dx^2}\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{16bcd^2}{}$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2(1-c^2x$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2(1-c^2x$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2(1-c^2x$$

Mathematica [A]
time = 2.74, size = 775, normalized size = 1.13

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^2*(3600*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(23 - 11*c^2*x^2 + 3*c
^4*x^4) + 54000*a^2*Sqrt[d]*Sqrt[1 - c^2*x^2]*Log[c*x] - 54000*a^2*Sqrt[d]*
Sqrt[1 - c^2*x^2]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] - 108000*a*b*Sqrt[d
- c^2*d*x^2]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*(Log[1 - E^
(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) - I*(PolyLog[2, -E^(I*ArcSin
[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])])) - 54000*b^2*Sqrt[d - c^2*d*x^2]*(
2*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 -
 ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) -
```

```
(2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[
c*x])]) + 2*(PolyLog[3, -E^(I*ArcSin[c*x])] - PolyLog[3, E^(I*ArcSin[c*x])]
)) - 6000*a*b*Sqrt[d - c^2*d*x^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^
2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin[c*x]]) + 1000*b^2*Sqrt[d - c^2*d*x^
2]*(27*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[
3*ArcSin[c*x]] - 6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])) + 30*a*b*Sqrt[
d - c^2*d*x^2]*(450*c*x - 15*ArcSin[c*x]*(30*Sqrt[1 - c^2*x^2] + 5*Cos[3*Ar
cSin[c*x]] - 3*Cos[5*ArcSin[c*x]]) + 25*Sin[3*ArcSin[c*x]] - 9*Sin[5*ArcSin
[c*x]]) - b^2*Sqrt[d - c^2*d*x^2]*(6750*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]
^2) + 125*(-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] - 27*(-2 + 25*ArcSin[c*
x]^2)*Cos[5*ArcSin[c*x]] + 30*ArcSin[c*x]*(-25*Sin[3*ArcSin[c*x]] + 9*(-50*
c*x + Sin[5*ArcSin[c*x]])))))/(54000*Sqrt[1 - c^2*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1573 vs. $2(657) = 1314$.
time = 0.36, size = 1574, normalized size = 2.29

method	result	size
default	Expression too large to display	1574

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -22/45*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*x^3*c^3+46/15*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*x*c+b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x
^2-1)*d^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^
2+1)^(1/2))+1/5*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^
6*c^6-14/15*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^4*c^
4+34/15*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^2*c^2-2/
125*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*x^6*c^6+532/3375*b^2*(-d*(c^
2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*x^4*c^4-9872/3375*b^2*(-d*(c^2*x^2-1))^(1/2
)*d^2/(c^2*x^2-1)*x^2*c^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
c^2*x^2-1)*d^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)
)-23/15*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)^2-a^2*d^(5/2
)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a^2*(-c^2*d*x^2+d)^(1/2)*d^2+1
/3*a^2*d*(-c^2*d*x^2+d)^(3/2)+1/5*(-c^2*d*x^2+d)^(5/2)*a^2+9394/3375*b^2*(-
d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)+2/25*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*x^5*c^5-46/15*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)+
46/15*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c+2*a
*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*ln
```

```
(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)/(c^2*x^2-1)*d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2/5*a*b*(-d*(c
^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^6*c^6-28/15*a*b*(-d*(c^2*x^2
-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4+68/15*a*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^2*c^2-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/(c^2*x^2-1)*d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*a*
b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*d^2*polylog(2,I*c*x
+(-c^2*x^2+1)^(1/2))+2/25*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*
x^2+1)^(1/2)*x^5*c^5-22/45*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)*x^3*c^3+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^
2*x^2-1)*d^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/15*(15*d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) -
 3*(-c^2*d*x^2 + d)^(5/2) - 5*(-c^2*d*x^2 + d)^(3/2)*d - 15*sqrt(-c^2*d*x^2
 + d)*d^2)*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 +
b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4
- 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*
sqrt(c*x + 1)*sqrt(-c*x + 1)/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{5/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x, x)
```

3.231 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=561

$$\frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2}-\frac{89b^2cd^2\sqrt{d-c^2dx^2}\,\text{ArcSin}(cx)}{64\sqrt{1-c^2x^2}}+\frac{15bc^3d^2x^2\sqrt{d}}{}$$

```
[Out] -5/4*c^2*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))^2/x+31/64*b^2*c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)+1/32*b^2*c^2
*d^2*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-1/8*b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+
b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-15/8*c^2*d^2*x*(a+b*arcsin(c*x))^2*(-c^
2*d*x^2+d)^(1/2)-89/64*b^2*c*d^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)+15/8*b*c^3*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)-I*c*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(
1/2)-5/8*c*d^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2
)+2*b*c*d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/
2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+b*c*d^2*(a+b*arcsin(c*x))*(-
c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.42, antiderivative size = 561, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.517$, Rules used = {4785, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 4773, 4721, 3798, 2221, 2317, 2438}

$$-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2-\frac{5cd^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^3}{8b\sqrt{1-c^2x^2}}-\frac{icd^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}-\frac{1}{8}bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))+bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))+\frac{2bcd^2\sqrt{d-c^2dx^2}\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{5}{4}c^2dx(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2-\frac{(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{x}+\frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\text{ArcSin}(cx))}{8\sqrt{1-c^2x^2}}-\frac{ib^2cd^2\sqrt{d-c^2dx^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{89b^2cd^2\text{ArcSin}(cx)\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}+\frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (31*b^2*c^2*d^2*x*Sqrt[d - c^2*d*x^2])/64 + (b^2*c^2*d^2*x*(1 - c^2*x^2)*Sq
rt[d - c^2*d*x^2])/32 - (89*b^2*c*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*
Sqrt[1 - c^2*x^2]) + (15*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(8*Sqrt[1 - c^2*x^2]) + b*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]) - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 - (15*c^2*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^
2)/8 - (I*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2
] - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 - ((d - c^2*d
*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x - (5*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^3)/(8*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d^2*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = -\frac{(d-c^2dx^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{x} - \left(5c^2d\right)\int \left(d-c^2dx^2\right)^{3/2}\left(a+\right.$$

$$= \frac{1}{2}bcd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right) - \frac{5}{4}c^2dx\left(d-c^2d\right.$$

$$= -\frac{1}{8}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\,($$

$$= -\frac{11}{16}b^2c^2d^2x\sqrt{d-c^2dx^2} + \frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{15}{}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2} + \frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{11b^2}{}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2} + \frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{89b^2}{}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2} + \frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{89b^2}{}$$

$$= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2} + \frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{89b^2}{}$$

Mathematica [**A**]

time = 1.40, size = 586, normalized size = 1.04

$$\frac{d^2\left(-256a^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}-288a^2c^2x^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}+64a^2c^4x^4\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}-160b^2cx\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)^3+480a^2c\sqrt{d}\,x\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)-128abcx\sqrt{d-c^2dx^2}\,\cos(2\mathrm{ArcSin}(cx))-4abcx\sqrt{d-c^2dx^2}\,\cos(4\mathrm{ArcSin}(cx))+512abcx\sqrt{d-c^2dx^2}\,\log(cx)-256ib^2cx\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)+64b^2cx\sqrt{d-c^2dx^2}\,\sin(2\mathrm{ArcSin}(cx))+b^2cx\sqrt{d-c^2dx^2}\,\sin(4\mathrm{ArcSin}(cx))-4b\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)\left(128a\sqrt{1-c^2x^2}+32bcx\cos(2\mathrm{ArcSin}(cx))+bcx\cos(4\mathrm{ArcSin}(cx))-128bcx\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)+64acx\sin(2\mathrm{ArcSin}(cx))+4acx\sin(4\mathrm{ArcSin}(cx))\right)-8b\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)^2\left(60acx+32ibcx+32b\sqrt{1-c^2x^2}+16bcx\sin(2\mathrm{ArcSin}(cx))+bcx\sin(4\mathrm{ArcSin}(cx))\right)\right)}{256x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^2*(-256*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - 288*a^2*c^2*x^2*Sqrt
[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 64*a^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sqrt[d
 - c^2*d*x^2] - 160*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 + 480*a^2*c*S
qrt[d]*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 +
c^2*x^2))] - 128*a*b*c*x*Sqrt[d - c^2*d*x^2]*Cos[2*ArcSin[c*x]] - 4*a*b*c*x
*Sqrt[d - c^2*d*x^2]*Cos[4*ArcSin[c*x]] + 512*a*b*c*x*Sqrt[d - c^2*d*x^2]*L
og[c*x] - (256*I)*b^2*c*x*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*
x])] + 64*b^2*c*x*Sqrt[d - c^2*d*x^2]*Sin[2*ArcSin[c*x]] + b^2*c*x*Sqrt[d -
 c^2*d*x^2]*Sin[4*ArcSin[c*x]] - 4*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(128*a
*Sqrt[1 - c^2*x^2] + 32*b*c*x*Cos[2*ArcSin[c*x]] + b*c*x*Cos[4*ArcSin[c*x]]
 - 128*b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])] + 64*a*c*x*Sin[2*ArcSin[c*x]] +
 4*a*c*x*Sin[4*ArcSin[c*x]]) - 8*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*(60*a*
c*x + (32*I)*b*c*x + 32*b*Sqrt[1 - c^2*x^2] + 16*b*c*x*Sin[2*ArcSin[c*x]] +
 b*c*x*Sin[4*ArcSin[c*x]])))/(256*x*Sqrt[1 - c^2*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3584 vs. 2(521) = 1042.
time = 0.42, size = 3585, normalized size = 6.39

method	result	size
default	Expression too large to display	3585

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2*d^2/(c^2*x^2-1)/x-17/32*I*a*b*(-d*
(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)*x-33/128*I*b^2*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*
c^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-17/64*I*b^2*(-d*(c^2*x^2-1
))^(1/2)*sin(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)^2*(-c^2*x^2+1)^
(1/2)*x+33/128*b^2*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c/(c^2*x^2
-1)*arcsin(c*x)-63/512*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)+63/512*I*b^2*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c/
(c^2*x^2-1)-a^2/d/x*(-c^2*d*x^2+d)^(7/2)-a^2*c^2*x*(-c^2*d*x^2+d)^(5/2)-5/4
*a^2*c^2*d*x*(-c^2*d*x^2+d)^(3/2)-15/8*a^2*c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)-1
5/8*a^2*c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-
1/64*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*x^5+1/4*a*b*(-d*(c^2*x^
2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)*x^5-11/8*a*b*(-d*(c^2*x^2-1))^(
```

1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)*x^3+17/32*a*b*(-d*(c^2*x^2-1))^(1/2)*s
in(3*arcsin(c*x))*d^2*c/(c^2*x^2-1)*arcsin(c*x)+15/8*a*b*(-d*(c^2*x^2-1))^(
1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*d^2*c-2*a*b*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)
*d^2*c-7/8*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*x+1/1
6*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^4-9/1
6*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2-33/
128*a*b*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c^3/(c^2*x^2-1)*x^2-1
5/32*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*x+1/16*I*a*b*(-d*(c^2
*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*x^5+31/128*I*a*b*(-d*(c^2*x^2-1))^(1/2)*
sin(3*arcsin(c*x))*d^2*c/(c^2*x^2-1)+13/32*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2
*c^4/(c^2*x^2-1)*x^3+79/64*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*a
rcsin(c*x)^2*(-c^2*x^2+1)^(1/2)-15/32*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/
(c^2*x^2-1)*arcsin(c*x)*x+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*
(-c^2*x^2+1)^(1/2)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-d*(c^2*x^
2-1))^(1/2)*d^2*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*polylog(2,I*c*x+(-c^2*x^2+
1)^(1/2))-63/512*I*b^2*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c^3/(c
^2*x^2-1)*x^2-15/64*I*b^2*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c/(
c^2*x^2-1)*arcsin(c*x)^2+31/128*I*b^2*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c
*x))*d^2*c/(c^2*x^2-1)*arcsin(c*x)-33/128*b^2*(-d*(c^2*x^2-1))^(1/2)*cos(3*
arcsin(c*x))*d^2*c^3/(c^2*x^2-1)*arcsin(c*x)*x^2-2*b^2*(-d*(c^2*x^2-1))^(1/
2)*d^2*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))-2*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/16*b^2*(-d*(c^2*x^2-1))^(1/2)*d
^2*c^5/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4-9/16*b^2*(-d*(c^2*x^2
-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+63/512*b^
2*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*(-c^2*x^2+1
)^(1/2)*x-17/64*b^2*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^3/(c^2*
x^2-1)*arcsin(c*x)^2*x^2+1/16*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2
-1)*arcsin(c*x)*x^5+1/64*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*(
-c^2*x^2+1)^(1/2)*x^4+13/32*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1
)*arcsin(c*x)*x^3+15/64*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)*x^2+5/8*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2
*x^2-1)*arcsin(c*x)^3*d^2*c+1/8*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2
-1)*arcsin(c*x)^2*x^5-11/16*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*
arcsin(c*x)^2*x^3-7/16*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsi
n(c*x)^2*x+65/512*b^2*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^3/(c^
2*x^2-1)*x^2+17/64*b^2*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c/(c^2
*x^2-1)*arcsin(c*x)^2+33/128*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c/(c^2*x^2-1)*a
rcsin(c*x)*(-c^2*x^2+1)^(1/2)-65/512*b^2*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsi
n(c*x))*d^2*c/(c^2*x^2-1)+15/32*I*a*b*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c
*x))*d^2*c^3/(c^2*x^2-1)*arcsin(c*x)*x^2-15/32*a*b*(-d*(c^2*x^2-1))^(1/2)*c
os(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-33/1
28*I*a*b*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*(-c^
2*x^2+1)^(1/2)*x-1/4*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*arcsi

```
n(c*x)*(-c^2*x^2+1)^(1/2)*x^4-3/4*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2
*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+31/128*a*b*(-d*(c^2*x^2-1))^(1/2
)*sin(3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x-17/32*a*b*(-d
*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^3/(c^2*x^2-1)*arcsin(c*x)*x^2-
15/32*I*a*b*(-d*(c^2*x^2-1))^(1/2)*cos(3*arcsin(c*x))*d^2*c/(c^2*x^2-1)*arc
sin(c*x)-31/128*I*a*b*(-d*(c^2*x^2-1))^(1/2)*sin(3*arcsin(c*x))*d^2*c^3/(c^
2*x^2-1)*x^2+79/32*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2
-1)*arcsin(c*x)*d^2*c-33/128*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)
*x-31/128*I*b^2*(-d*(c^2*x^2-1))^(1/2)*sin(3*ar...
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] -1/8*(10*(-c^2*d*x^2 + d)^(3/2)*c^2*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^2*d^2*x
 + 15*c*d^(5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)/x)*a^2 + sqrt(d)*int
egrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^
2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)
/x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/x**2, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{5/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^2, x)
```

3.232 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=740

$$\frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2}+\frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{2}{27}b^2c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\,\mathrm{ArcS}}{\sqrt{1-c^2x^2}}$$

```
[Out] -5/6*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-1/2*(-c^2*d*x^2+d)^(5/2
)*(a+b*arcsin(c*x))^2/x^2+40/9*b^2*c^2*d^2*(-c^2*d*x^2+d)^(1/2)+2/27*b^2*c^
2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-5/2*c^2*d^2*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)+5*a*b*c^3*d^2*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5
*b^2*c^3*d^2*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b*c*d^2*
(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)-1/3*b*c^3*d^2*x
*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/9*b*c^5*d^2*x^
3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5*c^2*d^2*(a+b*
arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2
*x^2+1)^(1/2)-b^2*c^2*d^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)-5*I*b*c^2*d^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x
^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5*I*b*c^2*d^2*(a+b*arc
sin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^
2+1)^(1/2)+5*b^2*c^2*d^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)-5*b^2*c^2*d^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)
)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.66, antiderivative size = 740, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 20, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.690$, Rules used = {4785, 4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45, 276, 4777, 12, 1265, 911, 1167, 214}

$$-\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(-e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}+\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_2\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\mathrm{ArcSin}(cx))^2-\frac{bcd^2\sqrt{d-c^2dx^2}(a+b\mathrm{ArcSin}(cx))}{x\sqrt{1-c^2x^2}}+\frac{5c^2d^2\sqrt{d-c^2dx^2}\tanh^{-1}\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}-\frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\mathrm{ArcSin}(cx))^2-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\mathrm{ArcSin}(cx))^2}{2x^2}-\frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\mathrm{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}-\frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\mathrm{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_3\left(-e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\,\mathrm{Li}_3\left(e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{5b^2c^3d^2x\mathrm{ArcSin}(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2}+\frac{2}{27}b^2c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{b^2c^2d^2\sqrt{d-c^2dx^2}\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (40*b^2*c^2*d^2*Sqrt[d - c^2*d*x^2])/9 + (5*a*b*c^3*d^2*x*Sqrt[d - c^2*d*x^
2])/Sqrt[1 - c^2*x^2] + (2*b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/2
7 + (5*b^2*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (
b*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2]) - (b
*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) -
 (2*b*c^5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*
x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - (5*c^2*d*
(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/6 - ((d - c^2*d*x^2)^(5/2)*(a
+ b*ArcSin[c*x])^2)/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
```

```
c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((5*I)*b*c^2*
d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])
/Sqrt[1 - c^2*x^2] + ((5*I)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (5*b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (5*b^2*c^
2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
```

```
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
```

```
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{x^3}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{2x^2} - \frac{1}{2}(5c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a}{x}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{2bc^3d^2x\sqrt{d-c^2dx^2}\,(a+b}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}\,(a+b\,\mathrm{s}}{3\sqrt{1-c^2x^2}}$$

$$= \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3}{}$$

$$= \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\,\sin^{-1}(cx)}{\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{}}{}$$

$$= \frac{55}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{5}{27}b^2c^2d^2(1-c^2$$

$$= \frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{2}{27}b^2c^2d^2(1-c^2$$

$$= \frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{2}{27}b^2c^2d^2(1-c^2$$

Mathematica [A]
time = 6.90, size = 1073, normalized size = 1.45

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*((-7*a^2*c^2*d^2)/3 - (a^2*d^2)/(2*x^2) + (a^2*c^
4*d^2*x^2)/3) - (5*a^2*c^2*d^(5/2)*Log[x])/2 + (5*a^2*c^2*d^(5/2)*Log[d + S
qrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/2 - 4*a*b*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*
(-((c*x)/Sqrt[1 - c^2*x^2]) + ArcSin[c*x] + (ArcSin[c*x]*(Log[1 - E^(I*ArcS
in[c*x])] - Log[1 + E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (I*(PolyLog[2,
 -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]) -
 2*b^2*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(-2 - (2*c*x*ArcSin[c*x])/Sqrt[1 - c^2
*x^2] + ArcSin[c*x]^2 + (ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1
+ E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + ((2*I)*ArcSin[c*x]*(PolyLog[2, -
E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (2
*(-PolyLog[3, -E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])]))/Sqrt[1
- c^2*x^2]) - (a*b*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(-9*c*x + 9*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - Sin[3*ArcSin[c*x]]))/(
18*Sqrt[1 - c^2*x^2]) - (b^2*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(27*Sqrt[1 - c^2
*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] - 6*
ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108*Sqrt[1 - c^2*x^2]) + (a*b*c
^2*d^3*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*
x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 +
E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2
, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]
/2]))/(4*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*d^3*Sqrt[1 - c^2*x^2]*(-4*ArcSin
[c*x]*Cot[ArcSin[c*x]/2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*
x]^2*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])
] + 8*Log[Tan[ArcSin[c*x]/2]] - (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c
*x])] + (8*I)*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(
I*ArcSin[c*x])] - 8*PolyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSi
n[c*x]/2]^2 - 4*ArcSin[c*x]*Tan[ArcSin[c*x]/2]))/(8*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1673 vs. 2(708) = 1416.
time = 0.44, size = 1674, normalized size = 2.26

method	result	size
default	Expression too large to display	1674

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -5/6*a^2*c^2*d*(-c^2*d*x^2+d)^(3/2)+5/2*a^2*c^2*d^(5/2)*ln((2*d+2*d^(1/2)*(
-c^2*d*x^2+d)^(1/2))/x)-5/2*a^2*c^2*(-c^2*d*x^2+d)^(1/2)*d^2-1/2*a^2/d/x^2*
(-c^2*d*x^2+d)^(7/2)-122/27*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)-
1/2*a^2*c^2*(-c^2*d*x^2+d)^(5/2)+5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)-5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d^2*c^2/(c^2*x^2-1)*arc
sin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2/27*b^2*(-d*(c^2*x^2-1))^(1/2
)*d^2*c^6/(c^2*x^2-1)*x^4+124/27*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^
2-1)*x^2+11/6*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)^2+
1/2*b^2*d^2*arcsin(c*x)^2*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)-14/3*a*b*(
-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+a*b*d^2*(-d*
(c^2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+2/3*a*b*(-d*(c^2*x^2-
1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)*x^4-16/3*a*b*(-d*(c^2*x^2-1))^(1/
2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)*x^2+2/9*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c
^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3+2/9*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^
5/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^3+1/3*b^2*(-d*(c^2*x^2-1))^(
1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)^2*x^4-8/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d
^2*c^4/(c^2*x^2-1)*arcsin(c*x)^2*x^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2
+1)^(1/2)*d^2*c^2/(c^2*x^2-1)*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))-5*b^2*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d^2*c^2/(c^2*x^2-1)*polylog(3,-I*c*x-(
-c^2*x^2+1)^(1/2))+5*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d^2*c^2/
(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+b^2*d^2*arcsin(c*x)*(-d*(c^
2*x^2-1))^(1/2)/x/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-5/2*b^2*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^
2*x^2+1)^(1/2))+5/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*d^2*c^2/(
c^2*x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-14/3*b^2*(-d*(c^2*x
^2-1))^(1/2)*d^2*c^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-10*a*b*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(2*c^2*x^2-2)*arcsin(c*x)*l
n(1+I*c*x+(-c^2*x^2+1)^(1/2))+10*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1
/2)*d^2*c^2/(2*c^2*x^2-2)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+10*I*a
*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*d^2*c^2/(2*c^2*x^2-2)*polylog(
2,-I*c*x-(-c^2*x^2+1)^(1/2))-10*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)*d^2*c^2/(2*c^2*x^2-2)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+11/3*a*b*(-d
*(c^2*x^2-1))^(1/2)*d^2*c^2/(c^2*x^2-1)*arcsin(c*x)+a*b*d^2*arcsin(c*x)*(-d
*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
```

```
[Out] 1/6*(15*c^2*d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))
 - 3*(-c^2*d*x^2 + d)^(5/2)*c^2 - 5*(-c^2*d*x^2 + d)^(3/2)*c^2*d - 15*sqrt(
-c^2*d*x^2 + d)*c^2*d^2 - 3*(-c^2*d*x^2 + d)^(7/2)/(d*x^2))*a^2 + sqrt(d)*i
ntegrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*
d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
1)/x^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/x**3, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{5/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^3,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^3, x)
```

3.233 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}{x^4}\,dx$

Optimal. Leaf size=591

$$-\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2}-\frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x}+\frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)}{12\sqrt{1-c^2x^2}}-\frac{5bc^5d^2x^2\sqrt{d-c}}{2\sqrt{}}$$

```
[Out] 5/3*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x-1/3*(-c^2*d*x^2+d)^(5/
2)*(a+b*arcsin(c*x))^2/x^3-7/12*b^2*c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)-1/3*b^2*
c^2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/x-1/3*b*c*d^2*(-c^2*x^2+1)^(3/2)*
(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x^2+5/2*c^4*d^2*x*(a+b*arcsin(c*x))^
2*(-c^2*d*x^2+d)^(1/2)+23/12*b^2*c^3*d^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)-5/2*b*c^5*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)+7/3*I*c^3*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+5/6*c^3*d^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/(-
c^2*x^2+1)^(1/2)-14/3*b*c^3*d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^
(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+7/3*I*b^2*c^3*d^2*polylog
(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-7/
3*b*c^3*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.56, antiderivative size = 591, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.517$, Rules used = {4785, 4741, 4737, 4723, 327, 222, 4773, 4721, 3798, 2221, 2317, 2438, 201, 4775, 283}

Antiderivative was successfully verified.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (-7*b^2*c^4*d^2*x*Sqrt[d - c^2*d*x^2])/12 - (b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(3*x) + (23*b^2*c^3*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(
12*Sqrt[1 - c^2*x^2]) - (5*b*c^5*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(2*Sqrt[1 - c^2*x^2]) - (7*b*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/2 + (((7*I)/3)*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2)/Sqrt[1 - c^2*x^2] + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x])^2)/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) + (5*
c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*Sqrt[1 - c^2*x^2])
- (14*b*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((7*I)/3)*b^2*c^3*d^2*Sqrt[d - c^2*d*
x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
```

```
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{x^4}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3x^3} - \frac{1}{3}(5c^2d)\int \frac{(d-c^2dx^2)^{3/2}(a}{x}$$

$$= -\frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))}{3x^2} + \frac{5c^2d(d-c^2dx}{}$$

$$= -\frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}$$

$$= \frac{2}{3}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} - \frac{5bc^5d^2x}{}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{2b^2c^3}{}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c}{}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c}{}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c}{}$$

Mathematica [A]

time = 2.42, size = 690, normalized size = 1.17

$$\frac{d^2\left(-4abcx\sqrt{d-c^2dx^2}+3abc^3x^3\sqrt{d-c^2dx^2}-6abc^5x^5\sqrt{d-c^2dx^2}-4a^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}+28a^2c^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}-4b^2c^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}+6a^2c^4x^4\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}-3b^2c^4x^4\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}+10b^2c^3x^3\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)^3-30a^2c^3\sqrt{d}\,x^3\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)-56abc^3x^3\sqrt{d-c^2dx^2}\log(cx)+28ib^2c^3x^3\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)+b\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)\left(-4bcx-6a\sqrt{1-c^2x^2}+48ac^2x^2\sqrt{1-c^2x^2}+3bc^3x^3\cos(2\mathrm{ArcSin}(cx))-2a\cos(3\mathrm{ArcSin}(cx))-56bc^3x^3\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)+6ac^3x^3\sin(2\mathrm{ArcSin}(cx))\right)+b\sqrt{d-c^2dx^2}\,\mathrm{ArcSin}(cx)^2\left(30ac^3x^3+4b\left(7ic^3x^3-\sqrt{1-c^2x^2}+7c^2x^2\sqrt{1-c^2x^2}\right)+3bc^3x^3\sin(2\mathrm{ArcSin}(cx))\right)\right)}{12x^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d^2*(-4*a*b*c*x*Sqrt[d - c^2*d*x^2] + 3*a*b*c^3*x^3*Sqrt[d - c^2*d*x^2] -
6*a*b*c^5*x^5*Sqrt[d - c^2*d*x^2] - 4*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2] + 28*a^2*c^2*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - 4*b^2*c^2*x^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 6*a^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sq
rt[d - c^2*d*x^2] - 3*b^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 1
0*b^2*c^3*x^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 30*a^2*c^3*Sqrt[d]*x^3*Sq
rt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))]
- 56*a*b*c^3*x^3*Sqrt[d - c^2*d*x^2]*Log[c*x] + (28*I)*b^2*c^3*x^3*Sqrt[d -
 c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])] + b*Sqrt[d - c^2*d*x^2]*ArcSi
n[c*x]*(-4*b*c*x - 6*a*Sqrt[1 - c^2*x^2] + 48*a*c^2*x^2*Sqrt[1 - c^2*x^2] +
 3*b*c^3*x^3*Cos[2*ArcSin[c*x]] - 2*a*Cos[3*ArcSin[c*x]] - 56*b*c^3*x^3*Log
[1 - E^((2*I)*ArcSin[c*x])] + 6*a*c^3*x^3*Sin[2*ArcSin[c*x]]) + b*Sqrt[d -
c^2*d*x^2]*ArcSin[c*x]^2*(30*a*c^3*x^3 + 4*b*((7*I)*c^3*x^3 - Sqrt[1 - c^2*
x^2] + 7*c^2*x^2*Sqrt[1 - c^2*x^2]) + 3*b*c^3*x^3*Sin[2*ArcSin[c*x]])))/(12
*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3854 vs. 2(541) = 1082.
time = 0.50, size = 3855, normalized size = 6.52

method	result	size
default	Expression too large to display	3855

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*x-1/4*b^2*(-d*(c^2*x^2-1
))^(1/2)*d^2*c^6/(c^2*x^2-1)*x^3-46/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^
4*x^4-15*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^2+56/3*I*a*b*(-d*(c^2*x^2-1
))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-49/3*I*a*b*(-d*(
c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8-7/3*I*a
*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*c^4-2
8*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*d^2*c^3/(3*c^
2*x^2-3)+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^2/(
c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+294*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*
x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-406*a*b*(-d*(c^2*x^2-1))^
(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+21*a*b*
(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*
```

x^2+1)^(1/2)*c^5+380/3*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^
2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4+21*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^
4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+147*
I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1)*
arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^7-49/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/
(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)*c^6-35*I
b^2(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*a
rcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(6
3*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)*c^4-1/3*a^2/
d/x^3*(-c^2*d*x^2+d)^(7/2)+4/3*a^2*c^4*x*(-c^2*d*x^2+d)^(5/2)+5/3*a^2*c^4*d
x(-c^2*d*x^2+d)^(3/2)+5/2*a^2*c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/2*a^2*c^4*
d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+4/3*a^2*c^2/
d/x*(-c^2*d*x^2+d)^(7/2)+a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arc
sin(c*x)*x^3-a*b*(-d*(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)*x+1
/2*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^6/(c^2*x^2-1)*arcsin(c*x)^2*x^3-1/2*b^2
(-d(c^2*x^2-1))^(1/2)*d^2*c^4/(c^2*x^2-1)*arcsin(c*x)^2*x-56/3*b^2*(-d*(c
^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+71/3*b^2
(-d(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6-1
6/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*
c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*x^2
-1)*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^3/(c
^2*x^2-1)*arcsin(c*x)^2-5/6*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
c^2*x^2-1)*arcsin(c*x)^3*d^2*c^3-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(c^
2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+14/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c
^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*d^2*c^3+7/3*
I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*arcs
in(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3+5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4
*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+1/3*b^2*(-d*(c^2*
x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)*c-7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x
^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-49/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(
63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^8-21*I*b^2*(-d*(c^2*
x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1
/2)*c^7+56/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3
/(c^2*x^2-1)*arcsin(c*x)*c^6-49/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*
x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+14/3*I*a*b*(-d*(c^2*x^2-
1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*c^3+7/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*
x/(c^2*x^2-1)*(-c^2*x^2+1)*c^4-5/2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*d^2*c^3-5*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(6
3*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3+1/2*a*b*(-d*(c^2
*x^2-1))^(1/2)*d^2*c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^2+2/3*a*b*(-d*(c^2*
x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)+294
*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1)
*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-70*I*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(63

```
*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+1
90/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)
*arcsin(c*x)^2*c^4-23/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x
^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2+14*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)*d^2*c^3/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)
)+14*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*d^2*c^3/(3*c^2*x^2-3)*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2
*c^5/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2-5*b^2*(-d*(c^2*x^2-1))^
(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*c^3+147*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*...
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] 1/6*(10*(-c^2*d*x^2 + d)^(3/2)*c^4*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^4*d^2*x
+ 15*c^3*d^(5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)*c^2/x - 2*(-c^2*d*x
^2 + d)^(7/2)/(d*x^3))*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^
2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*
c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^4, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/x**4, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^4, x)
```

3.234 $\int \frac{x^5(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=400

$$\frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{298b^2(1-c^2x^2)}{225c^6\sqrt{d-c^2dx^2}}-\frac{76b^2(1-c^2x^2)^2}{675c^6\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)^3}{125c^6\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx}{15c^5\sqrt{d-c^2dx^2}}$$

```
[Out] 298/225*b^2*(-c^2*x^2+1)/c^6/(-c^2*d*x^2+d)^(1/2)-76/675*b^2*(-c^2*x^2+1)^2
/c^6/(-c^2*d*x^2+d)^(1/2)+2/125*b^2*(-c^2*x^2+1)^3/c^6/(-c^2*d*x^2+d)^(1/2)
+16/15*a*b*x*(-c^2*x^2+1)^(1/2)/c^5/(-c^2*d*x^2+d)^(1/2)+16/15*b^2*x*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)/c^5/(-c^2*d*x^2+d)^(1/2)+8/45*b*x^3*(a+b*arcsin(c*
x))*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+2/25*b*x^5*(a+b*arcsin(c*x)
)*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-8/15*(a+b*arcsin(c*x))^2*(-c^2*
d*x^2+d)^(1/2)/c^6/d-4/15*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/
d-1/5*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.39, antiderivative size = 400, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.241$, Rules used = {4795, 4767, 4715, 267, 4723, 272, 45}

$$\frac{2bx^5\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{25c\sqrt{d-c^2dx^2}}-\frac{x^4\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2}{5c^2d}-\frac{8\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2}{15c^6d}-\frac{4x^2\sqrt{d-c^2dx^2}\,(a+b\mathrm{ArcSin}(cx))^2}{15c^4d}+\frac{8bx^3\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{45c^3\sqrt{d-c^2dx^2}}+\frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)}{15c^5\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)^3}{125c^6\sqrt{d-c^2dx^2}}-\frac{76b^2(1-c^2x^2)^2}{675c^6\sqrt{d-c^2dx^2}}+\frac{298b^2(1-c^2x^2)}{225c^6\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (16*a*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (298*b^2*(1 - c
^2*x^2))/(225*c^6*Sqrt[d - c^2*d*x^2]) - (76*b^2*(1 - c^2*x^2)^2)/(675*c^6*
Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^3)/(125*c^6*Sqrt[d - c^2*d*x^2]
) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(15*c^5*Sqrt[d - c^2*d*x^2]) +
 (8*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3*Sqrt[d - c^2*d*x^2
]) + (2*b*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c*Sqrt[d - c^2*d*x
^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^6*d) - (4*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4*d) - (x^4*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^5(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^4\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{5c^2d} + \frac{4\int \frac{x^3(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{5c^2} + \frac{\left(2b\sqrt{1-c^2x^2}\right)}{5c\ldots}$$

$$= \frac{2bx^5\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{4x^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{15c^4d} - \frac{x^4\sqrt{d\ldots}}{}$$

$$= \frac{8bx^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{45c^3\sqrt{d-c^2dx^2}} + \frac{2bx^5\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-\ldots}}{}$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{8bx^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{45c^3\sqrt{d-c^2dx^2}} + \frac{2bx^5\sqrt{1-c^2x^2}\,(a+b\ldots}{25c\sqrt{d-c^2dx\ldots}}$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{25c^6\sqrt{d-c^2dx^2}} - \frac{4b^2(1-c^2x^2)^2}{75c^6\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^3}{125c^6\sqrt{d-c^2dx^2}}\ldots$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{298b^2(1-c^2x^2)}{225c^6\sqrt{d-c^2dx^2}} - \frac{76b^2(1-c^2x^2)^2}{675c^6\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)\ldots}{125c^6\sqrt{d-c^2d\ldots}}$$

Mathematica [A]
time = 0.12, size = 230, normalized size = 0.58

$$\frac{30abcx\sqrt{1-c^2x^2}\,(120+20c^2x^2+9c^4x^4)+225a^2(-8+4c^2x^2+c^4x^4+3c^6x^6)-2b^2(-2072+1936c^2x^2+109c^4x^4+27c^6x^6)+30b\left(bcx\sqrt{1-c^2x^2}\,(120+20c^2x^2+9c^4x^4)+15a(-8+4c^2x^2+c^4x^4+3c^6x^6)\right)\mathrm{ArcSin}(cx)+225b^2(-8+4c^2x^2+c^4x^4+3c^6x^6)\,\mathrm{ArcSin}(cx)^2}{3375c^6\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (30*a*b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4*x^4) + 225*a^2*(-8
+ 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6) - 2*b^2*(-2072 + 1936*c^2*x^2 + 109*c^4*
x^4 + 27*c^6*x^6) + 30*b*(b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4
*x^4) + 15*a*(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6))*ArcSin[c*x] + 225*b^2*
(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6)*ArcSin[c*x]^2)/(3375*c^6*Sqrt[d - c^
2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.60, size = 1020, normalized size = 2.55

method	result
default	$a^2\left(-\frac{x^4\sqrt{-c^2d\,x^2+d}}{5c^2d}+\frac{-\frac{4x^2\sqrt{-c^2d\,x^2+d}}{15c^2d}-\frac{8\sqrt{-c^2d\,x^2+d}}{15d\,c^4}}{c^2}\right)+b^2\left(\frac{5\sqrt{-d\,(c^2x^2-1)}\,\left(2c^2x^2-2\ldots\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/5*x^4/c^2/d*(-c^2*d*x^2+d)^(1/2)+4/5/c^2*(-1/3*x^2/c^2/d*(-c^2*d*x^
2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2)))+b^2*(5/1728*(-d*(c^2*x^2-1))^(1
/2)*(2*c^2*x^2-2*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(6*I*arcsin(c*x)+9*arcsin(c*x)
^2-2)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)
^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^6/d/(c^2*x^2-1)-5/16*(-d*
(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*
I*arcsin(c*x))/c^6/d/(c^2*x^2-1)+5/1728*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x
^2+1)^(1/2)*x*c+2*c^2*x^2-1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^6/d/(c^
2*x^2-1)+1/4000*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*(25*arcsin(c*x)^2-
2)*cos(6*arcsin(c*x))-1/400*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin
(c*x)*sin(6*arcsin(c*x))-1/54000*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*(
2475*arcsin(c*x)^2-598)*cos(4*arcsin(c*x))+29/900*(-d*(c^2*x^2-1))^(1/2)/c^
6/d/(c^2*x^2-1)*arcsin(c*x)*sin(4*arcsin(c*x)))+2*a*b*(5/576*(-d*(c^2*x^2-1
))^(1/2)*(2*c^2*x^2-2*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+3*arcsin(c*x))/c^6/d/(
c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)
*(arcsin(c*x)+I)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/d/(c^2*x^2-1)+5/576*(-d*(c^2*x
^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x*c+2*c^2*x^2-1)*(-I+3*arcsin(c*x))/c^
6/d/(c^2*x^2-1)+1/160*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*
cos(6*arcsin(c*x))-1/800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(6*arc
sin(c*x))-11/240*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*cos(4
*arcsin(c*x))+29/1800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(4*arcsin
(c*x)))
```

Maxima [A]
time = 0.50, size = 365, normalized size = 0.91

$$-\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}\,x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}\,x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)b^2\arcsin(cx)^2-\frac{2}{15}\left(\frac{3\sqrt{-c^2dx^2+d}\,x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}\,x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)ab\arcsin(cx)-\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}\,x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}\,x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)a^2+\frac{2}{3375}b^2\left(\frac{27\sqrt{-c^2x^2+1}\,c^2x^4+136\sqrt{-c^2x^2+1}\,x^2+\frac{2072\sqrt{-c^2x^2+1}}{c^2}}{c^4\sqrt{d}}+\frac{15\,(9\,c^4x^5+20\,c^2x^3+120\,x)\arcsin(cx)}{c^5\sqrt{d}}\right)+\frac{2\,(9\,c^4x^5+20\,c^2x^3+120\,x)ab}{225\,c^5\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] -1/15*(3*sqrt(-c^2*d*x^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4
*d) + 8*sqrt(-c^2*d*x^2 + d)/(c^6*d))*b^2*arcsin(c*x)^2 - 2/15*(3*sqrt(-c^2
*d*x^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4*d) + 8*sqrt(-c^2*
d*x^2 + d)/(c^6*d))*a*b*arcsin(c*x) - 1/15*(3*sqrt(-c^2*d*x^2 + d)*x^4/(c^2
*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4*d) + 8*sqrt(-c^2*d*x^2 + d)/(c^6*d))*
a^2 + 2/3375*b^2*((27*sqrt(-c^2*x^2 + 1)*c^2*x^4 + 136*sqrt(-c^2*x^2 + 1)*x
^2 + 2072*sqrt(-c^2*x^2 + 1)/c^2)/(c^4*sqrt(d)) + 15*(9*c^4*x^5 + 20*c^2*x^
```

```
3 + 120*x)*arcsin(c*x)/(c^5*sqrt(d))) + 2/225*(9*c^4*x^5 + 20*c^2*x^3 + 120
*x)*a*b/(c^5*sqrt(d))
```

Fricas [A]
time = 2.27, size = 276, normalized size = 0.69

$$-\frac{30\,(9\,abc^5x^5+20\,abc^3x^3+120\,abcx+(9\,b^2c^5x^5+20\,b^2c^3x^3+120\,b^2cx)\arcsin\,(cx))\sqrt{-c^2dx^2+d}\,\sqrt{-c^2x^2+1}+(27\,(25\,a^2-2\,b^2)c^6x^6+(225\,a^2-218\,b^2)c^4x^4+4\,(225\,a^2-968\,b^2)c^2x^2+225\,(3\,b^2c^6x^6+b^2c^4x^4+4\,b^2c^2x^2-8\,b^2)\arcsin\,(cx)^2-1800\,a^2+4144\,b^2+450\,(3\,abc^6x^6+abc^4x^4+4\,abc^2x^2-8\,ab)\arcsin\,(cx))\sqrt{-c^2dx^2+d}}{3375\,(c^8dx^2-c^6d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] -1/3375*(30*(9*a*b*c^5*x^5 + 20*a*b*c^3*x^3 + 120*a*b*c*x + (9*b^2*c^5*x^5
+ 20*b^2*c^3*x^3 + 120*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2
*x^2 + 1) + (27*(25*a^2 - 2*b^2)*c^6*x^6 + (225*a^2 - 218*b^2)*c^4*x^4 + 4*
(225*a^2 - 968*b^2)*c^2*x^2 + 225*(3*b^2*c^6*x^6 + b^2*c^4*x^4 + 4*b^2*c^2*
x^2 - 8*b^2)*arcsin(c*x)^2 - 1800*a^2 + 4144*b^2 + 450*(3*a*b*c^6*x^6 + a*b
*c^4*x^4 + 4*a*b*c^2*x^2 - 8*a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^8*d
*x^2 - c^6*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,{\left(a+b\,\mathrm{asin}(c\,x)\right)}^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.235 $\int \frac{x^4(a+b\textbf{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=337

$$\frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}}+\frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}}-\frac{15b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{64c^5\sqrt{d-c^2dx^2}}+\frac{3bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{8c^3\sqrt{d-c^2dx^2}}+bx^4\sqrt{}$$

```
[Out] 15/64*b^2*x*(-c^2*x^2+1)/c^4/(-c^2*d*x^2+d)^(1/2)+1/32*b^2*x^3*(-c^2*x^2+1)
/c^2/(-c^2*d*x^2+d)^(1/2)-15/64*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^5/(-c^
2*d*x^2+d)^(1/2)+3/8*b*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d
*x^2+d)^(1/2)+1/8*b*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+
d)^(1/2)+1/8*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^5/(-c^2*d*x^2+d)^(1
/2)-3/8*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/d-1/4*x^3*(a+b*arcsi
n(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.30, antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$, Rules used = {4795, 4737, 4723, 327, 222}

$$\frac{bx^4\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{8c\sqrt{d-c^2dx^2}}-\frac{x^3\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{4c^2d}+\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{8bc^5\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{8c^4d}+\frac{3bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{8c^3\sqrt{d-c^2dx^2}}-\frac{15b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{64c^5\sqrt{d-c^2dx^2}}+\frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}}+\frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (15*b^2*x*(1 - c^2*x^2))/(64*c^4*Sqrt[d - c^2*d*x^2]) + (b^2*x^3*(1 - c^2*x
^2))/(32*c^2*Sqrt[d - c^2*d*x^2]) - (15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/
(64*c^5*Sqrt[d - c^2*d*x^2]) + (3*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(8*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x]))/(8*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*c^2*d)
 + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(8*b*c^5*Sqrt[d - c^2*d*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^3\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{4c^2d} + \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{4c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right.}{2c}$$

$$= \frac{bx^4\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{8c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{8c^4d} - \frac{x^3\sqrt{d}}{}$$

$$= \frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{8c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}\,(a+b}{8c\sqrt{d-c^2dx}}$$

$$= \frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}} + \frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{8c^3\sqrt{d-c^2dx^2}} + \frac{b}{}$$

$$= \frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}} + \frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}} - \frac{15b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{64c^5\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1}}{}$$

Mathematica [A]

time = 0.92, size = 283, normalized size = 0.84

$$\frac{32a^2c\sqrt{d}\,x(-1+c^2x^2)(3+2c^2x^2)-96a^2\sqrt{d-c^2dx^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+b^2\sqrt{d}\,\sqrt{1-c^2x^2}\,(32\text{ArcSin}(cx)^3+4\text{ArcSin}(cx)(-16\cos(2\text{ArcSin}(cx))+\cos(4\text{ArcSin}(cx)))+32\sin(2\text{ArcSin}(cx))-\sin(4\text{ArcSin}(cx))+8\text{ArcSin}(cx)^2(-8\sin(2\text{ArcSin}(cx))+\sin(4\text{ArcSin}(cx))))-4ab\sqrt{d}\,\sqrt{1-c^2x^2}\,(16\cos(2\text{ArcSin}(cx))-\cos(4\text{ArcSin}(cx))-4\text{ArcSin}(cx)(6\text{ArcSin}(cx)-8\sin(2\text{ArcSin}(cx))+\sin(4\text{ArcSin}(cx))))}{256c^5\sqrt{d}\,\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (32*a^2*c*Sqrt[d]*x*(-1 + c^2*x^2)*(3 + 2*c^2*x^2) - 96*a^2*Sqrt[d - c^2*d*
x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b^2*Sqrt[
d]*Sqrt[1 - c^2*x^2]*(32*ArcSin[c*x]^3 + 4*ArcSin[c*x]*(-16*Cos[2*ArcSin[c*
x]] + Cos[4*ArcSin[c*x]]) + 32*Sin[2*ArcSin[c*x]] - Sin[4*ArcSin[c*x]] + 8*
ArcSin[c*x]^2*(-8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])) - 4*a*b*Sqrt[d]
*Sqrt[1 - c^2*x^2]*(16*Cos[2*ArcSin[c*x]] - Cos[4*ArcSin[c*x]] - 4*ArcSin[c
*x]*(6*ArcSin[c*x] - 8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c^5*
Sqrt[d]*Sqrt[d - c^2*d*x^2])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 721 vs. $2(297) = 594$.
time = 0.60, size = 722, normalized size = 2.14

method	result
default	$-\frac{a^2x^3\sqrt{-c^2d\,x^2+d}}{4c^2d}-\frac{3a^2x\sqrt{-c^2d\,x^2+d}}{8c^4d}+\frac{3a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{8c^4\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d\,(c^2x^2-1)}}{8c^5}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a^2*x^3/c^2/d*(-c^2*d*x^2+d)^(1/2)-3/8*a^2/c^4*x/d*(-c^2*d*x^2+d)^(1/2
)+3/8*a^2/c^4/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^
2*(-1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(
c*x)^3+1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcs
in(c*x)+1/16*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*(2*arcsin(c*x)^2-1)*x
-1/128*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*cos(5*arcsin(c*
x))-1/512*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*(8*arcsin(c*x)^2-1)*sin(
5*arcsin(c*x))+15/128*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*
cos(3*arcsin(c*x))+1/512*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*(56*arcsi
n(c*x)^2-31)*sin(3*arcsin(c*x)))+2*a*b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)^2-1/16/c^5/(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*
x)*x-1/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*cos(5*arcsin(c*x))-1/64
*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*sin(5*arcsin(c*x))+15
/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*cos(3*arcsin(c*x))+7/64*(-d*(
c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcsin(c*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] -1/8*a^2*(2*sqrt(-c^2*d*x^2 + d)*x^3/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*x/(c^
4*d) - 3*arcsin(c*x)/(c^5*sqrt(d))) - sqrt(d)*integrate((b^2*x^4*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^4*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^2 - d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c
^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a + b\operatorname{asin}(cx))^2}{\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4 (a + b \operatorname{asin}(c x))^2}{\sqrt{d - c^2 d x^2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.236 $\int \frac{x^3(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=277

$$\frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{14b^2(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}}-\frac{2b^2(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}}+\frac{4b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^3\sqrt{d-c^2dx^2}}+\frac{2bx^3\sqrt{1-c^2x^2}\,(a+b}{9c\sqrt{d-c^2dx}}$$

```
[Out] 14/9*b^2*(-c^2*x^2+1)/c^4/(-c^2*d*x^2+d)^(1/2)-2/27*b^2*(-c^2*x^2+1)^2/c^4/
(-c^2*d*x^2+d)^(1/2)+4/3*a*b*x*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+
4/3*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+2/9*b*x^3
*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-2/3*(a+b*arcsi
n(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/d-1/3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^
2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.21, antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.241$, Rules used = {4795, 4767, 4715, 267, 4723, 272, 45}

$$-\frac{x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3c^2d}+\frac{2bx^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3c^4d}+\frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{4b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^3\sqrt{d-c^2dx^2}}-\frac{2b^2(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}}+\frac{14b^2(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (4*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (14*b^2*(1 - c^2*
x^2))/(9*c^4*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*x^2)^2)/(27*c^4*Sqrt[d
- c^2*d*x^2]) + (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^3*Sqrt[d - c^2
*d*x^2]) + (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c*Sqrt[d - c^
2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d) - (x^2*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{3c^2d} + \frac{2\int \frac{x(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{3c^2} + \frac{\left(2b\sqrt{1-c^2x^2}\right.}{3c}$$

$$= \frac{2bx^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{3c^4d} - \frac{x^2\sqrt{d}}{}$$

$$= \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{2bx^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}\,(a+b\sin}{3c^4d}$$

$$= \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{4b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^3\sqrt{d-c^2dx^2}} + \frac{2bx^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(c}{9c\sqrt{d-c^2dx^2}}$$

$$= \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{14b^2(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}} + \frac{4b^2x\sqrt{1-c^2x^2}\,\sin}{3c^3\sqrt{d-c^2dx}}$$

Mathematica [A]
time = 0.08, size = 176, normalized size = 0.64

$$\frac{6abcx\sqrt{1-c^2x^2}\,(6+c^2x^2)+9a^2(-2+c^2x^2+c^4x^4)-2b^2(-20+19c^2x^2+c^4x^4)+6b\left(bcx\sqrt{1-c^2x^2}\,(6+c^2x^2)+3a(-2+c^2x^2+c^4x^4)\right)\text{ArcSin}(cx)+9b^2(-2+c^2x^2+c^4x^4)\,\text{ArcSin}(cx)^2}{27c^4\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (6*a*b*c*x*Sqrt[1 - c^2*x^2]*(6 + c^2*x^2) + 9*a^2*(-2 + c^2*x^2 + c^4*x^4)
 - 2*b^2*(-20 + 19*c^2*x^2 + c^4*x^4) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(6 + c
^2*x^2) + 3*a*(-2 + c^2*x^2 + c^4*x^4))*ArcSin[c*x] + 9*b^2*(-2 + c^2*x^2 +
 c^4*x^4)*ArcSin[c*x]^2)/(27*c^4*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.43, size = 812, normalized size = 2.93

method	result
default	$a^2\left(-\frac{x^2\sqrt{-c^2d\,x^2+d}}{3c^2d}-\frac{2\sqrt{-c^2d\,x^2+d}}{3d\,c^4}\right)+b^2\left(\frac{\sqrt{-d\,(c^2x^2-1)}\,\left(2c^2x^2-2i\sqrt{-c^2x^2+1}\,xc-1\right)(}{432c^4d(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+b^
2*(1/432*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(6
```

```
*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1
/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/
c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*
x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^4/d/(c^2*x^2-1)+1/432*(-d*(c^2*x
^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x*c+2*c^2*x^2-1)*(-6*I*arcsin(c*x)+9*a
rcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)-1/216*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x
^2-1)*(9*arcsin(c*x)^2-2)*cos(4*arcsin(c*x))+1/36*(-d*(c^2*x^2-1))^(1/2)/c^
4/d/(c^2*x^2-1)*arcsin(c*x)*sin(4*arcsin(c*x)))+2*a*b*(1/144*(-d*(c^2*x^2-1
))^(1/2)*(2*c^2*x^2-2*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+3*arcsin(c*x))/c^4/d/(
c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*
(arcsin(c*x)+I)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1
)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^4/d/(c^2*x^2-1)+1/144*(-d*(c^2*x^2
-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x*c+2*c^2*x^2-1)*(-I+3*arcsin(c*x))/c^4/
d/(c^2*x^2-1)-1/24*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*cos
(4*arcsin(c*x))+1/72*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*sin(4*arcsin(
c*x)))
```

Maxima [A]
time = 0.50, size = 251, normalized size = 0.91

$$-\frac{1}{3}\,b^{2}\left(\frac{\sqrt{-c^{2}dx^{2}+d}\,x^{2}}{c^{2}d}+\frac{2\,\sqrt{-c^{2}dx^{2}+d}}{c^{4}d}\right)\arcsin\left(cx\right)^{2}-\frac{2}{3}\,ab\left(\frac{\sqrt{-c^{2}dx^{2}+d}\,x^{2}}{c^{2}d}+\frac{2\,\sqrt{-c^{2}dx^{2}+d}}{c^{4}d}\right)\arcsin\left(cx\right)-\frac{1}{3}\,a^{2}\left(\frac{\sqrt{-c^{2}dx^{2}+d}\,x^{2}}{c^{2}d}+\frac{2\,\sqrt{-c^{2}dx^{2}+d}}{c^{4}d}\right)+\frac{2}{27}\,b^{2}\left(\frac{\sqrt{-c^{2}x^{2}+1}\,x^{2}+\frac{20\,\sqrt{-c^{2}x^{2}+1}}{c^{2}}}{c^{2}\sqrt{d}}+\frac{3\,(c^{2}x^{3}+6\,x)\arcsin\left(cx\right)}{c^{3}\sqrt{d}}\right)+\frac{2\,(c^{2}x^{3}+6\,x)ab}{9\,c^{3}\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] -1/3*b^2*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^4*d)
)*arcsin(c*x)^2 - 2/3*a*b*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d
*x^2 + d)/(c^4*d))*arcsin(c*x) - 1/3*a^2*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d)
+ 2*sqrt(-c^2*d*x^2 + d)/(c^4*d)) + 2/27*b^2*((sqrt(-c^2*x^2 + 1)*x^2 + 20*
sqrt(-c^2*x^2 + 1)/c^2)/(c^2*sqrt(d)) + 3*(c^2*x^3 + 6*x)*arcsin(c*x)/(c^3*
sqrt(d))) + 2/9*(c^2*x^3 + 6*x)*a*b/(c^3*sqrt(d))
```

Fricas [A]
time = 2.56, size = 210, normalized size = 0.76

$$-\frac{6\,(abc^{3}x^{3}+6\,abcx+(b^{2}c^{3}x^{3}+6\,b^{2}cx)\arcsin\left(cx\right))\sqrt{-c^{2}dx^{2}+d}\,\sqrt{-c^{2}x^{2}+1}+((9\,a^{2}-2\,b^{2})c^{4}x^{4}+(9\,a^{2}-38\,b^{2})c^{2}x^{2}+9\,(b^{2}c^{4}x^{4}+b^{2}c^{2}x^{2}-2\,b^{2})\arcsin\left(cx\right)^{2}-18\,a^{2}+40\,b^{2}+18\,(abc^{4}x^{4}+abc^{2}x^{2}-2\,ab)\arcsin\left(cx\right))\sqrt{-c^{2}dx^{2}+d}}{27\,(c^{6}dx^{2}-c^{4}d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] -1/27*(6*(a*b*c^3*x^3 + 6*a*b*c*x + (b^2*c^3*x^3 + 6*b^2*c*x)*arcsin(c*x))*
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + ((9*a^2 - 2*b^2)*c^4*x^4 + (9*a^2
 - 38*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 + b^2*c^2*x^2 - 2*b^2)*arcsin(c*x)^2 -
```

```
18*a^2 + 40*b^2 + 18*(a*b*c^4*x^4 + a*b*c^2*x^2 - 2*a*b)*arcsin(c*x))*sqrt(
-c^2*d*x^2 + d))/(c^6*d*x^2 - c^4*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(a+b\operatorname{asin}(cx))^2}{\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.237 $\int \frac{x^2(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=206

$$\frac{b^2x\sqrt{d-c^2dx^2}}{4c^2d}-\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c^3\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(\ldots}{2c^2d}$$

```
[Out] -1/4*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/2*b*x^2*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/6*(a+b*arcsin
(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)+1/4*b^2*x*(-c^2*d*x^
2+d)^(1/2)/c^2/d-1/2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.15, antiderivative size = 213, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$, Rules used = {4795, 4737, 4723, 327, 222}

$$-\frac{x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2c^2d}+\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2c\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c^3\sqrt{d-c^2dx^2}}+\frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b^2*x*(1 - c^2*x^2))/(4*c^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*
ArcSin[c*x])/(4*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(2*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*Arc
Sin[c*x])^2)/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3
*Sqrt[d - c^2*d*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
```

```
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx &= -\frac{x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2c^2d}+\frac{\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{2c^2}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int x \cdots}{c\sqrt{d-\cdots}}\\ &= \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2c^2d}-\frac{\left(b^2\sqrt{1-\cdots}\right.}{\cdots}\\ &= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}\cdots}{2c^2d}\\ &= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{4c^3\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c\sqrt{d-c^2dx^2}}\cdots\end{aligned}$$

Mathematica [A]

time = 0.78, size = 210, normalized size = 1.02

$$\frac{12a^2cdx(-1+c^2x^2)-12a^2\sqrt{d}\,\sqrt{d-c^2dx^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)-6abd\sqrt{1-c^2x^2}\,(-2\mathrm{ArcSin}(cx)^2+\cos(2\mathrm{ArcSin}(cx))+2\mathrm{ArcSin}(cx)\sin(2\mathrm{ArcSin}(cx)))+b^2d\sqrt{1-c^2x^2}\,(4\mathrm{ArcSin}(cx)^3-6\mathrm{ArcSin}(cx)\cos(2\mathrm{ArcSin}(cx))+(3-6\mathrm{ArcSin}(cx)^2)\sin(2\mathrm{ArcSin}(cx)))}{24c^3d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

[Out] (12*a^2*c*d*x*(-1 + c^2*x^2) - 12*a^2*Sqrt[d]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - 6*a*b*d*Sqrt[1 - c^2*x^2]*(-2*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]]) + b^2*d*Sqrt[1 - c^2*x^2]*(4*ArcSin[c*x]^3 - 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + (3 - 6*ArcSin[c*x]^2)*Sin[2*ArcSin[c*x]]))/(24*c^3*d*Sqrt[d - c^2*d*x^2])

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 516 vs. $2(180) = 360$.
time = 0.27, size = 517, normalized size = 2.51

method	result
default	$-\frac{a^2 x\sqrt{-c^2 d\,x^2+d}}{2c^2 d}+\frac{a^2 \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{2c^2\sqrt{c^2 d}}+b^2\left(-\frac{\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{6c^3 d(c^2x^2-1)}\right.$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/2*a^2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2*a^2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^3+1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)+1/16*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*(2*arcsin(c*x)^2-1)*x+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*cos(3*arcsin(c*x))+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*(2*arcsin(c*x)^2-1)*sin(3*arcsin(c*x)))+2*a*b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2-1/16/c^3/(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*cos(3*arcsin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcsin(c*x)))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")

[Out] -1/2*a^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) - sqrt(d)*integrate((b^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^2 - d), x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c
^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a + b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx - 1)\,(cx + 1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(x**2*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,(a + b\,\mathrm{asin}(c\,x))^2}{\sqrt{d - c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.238 $\int \frac{x(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=146

$$\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}+\frac{2b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{c^2d}$$

```
[Out] 2*b^2*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)+2*a*b*x*(-c^2*x^2+1)^(1/2)/c/(-
c^2*d*x^2+d)^(1/2)+2*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^
(1/2)-(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A]
time = 0.09, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4767, 4715, 267}

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{c^2d}+\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{c\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))
/(c^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*Sqr
t[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^2*d)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{c^2d} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\int (a+b\sin^{-1}(cx))\,dx}{c\sqrt{d-c^2dx^2}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{c^2d} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int \sin^{-1}}{c\sqrt{d-c^2dx^2}}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{2b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{c^2d}$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{2b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}}{}$$

Mathematica [A]
time = 0.06, size = 86, normalized size = 0.59

$$\frac{(-1+c^2x^2)\,(a+b\mathrm{ArcSin}(cx))^2 + 2b\sqrt{1-c^2x^2}\left(acx+b\sqrt{1-c^2x^2}+bcx\mathrm{ArcSin}(cx)\right)}{c^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] ((-1 + c^2*x^2)*(a + b*ArcSin[c*x])^2 + 2*b*Sqrt[1 - c^2*x^2]*(a*c*x + b*Sq
rt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]))/(c^2*Sqrt[d - c^2*d*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.15, size = 316, normalized size = 2.16

method	result
default	$-\frac{a^2\sqrt{-c^2d\,x^2+d}}{c^2d} + b^2\left(-\frac{\sqrt{-d\,(c^2x^2-1)}\,\left(c^2x^2-i\sqrt{-c^2x^2+1}\,xc-1\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{2c^2d(c^2x^2-1)} - \right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/c^2/d*(-c^2*d*x^2+d)^(1/2)+b^2*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I
*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2
-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin
(c*x)^2-2-2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1
```

```
)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c
*x)-I)/c^2/d/(c^2*x^2-1))
```

Maxima [A]
time = 0.51, size = 130, normalized size = 0.89

$$2b^2\left(\frac{x\arcsin(cx)}{c\sqrt{d}}+\frac{\sqrt{-c^2x^2+1}}{c^2\sqrt{d}}\right)+\frac{2abx}{c\sqrt{d}}-\frac{\sqrt{-c^2dx^2+d}\,b^2\arcsin(cx)^2}{c^2d}-\frac{2\sqrt{-c^2dx^2+d}\,ab\arcsin(cx)}{c^2d}-\frac{\sqrt{-c^2dx^2+d}\,a^2}{c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 2*b^2*(x*arcsin(c*x)/(c*sqrt(d)) + sqrt(-c^2*x^2 + 1)/(c^2*sqrt(d))) + 2*a*
b*x/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b^2*arcsin(c*x)^2/(c^2*d) - 2*sqrt(-
c^2*d*x^2 + d)*a*b*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*x^2 + d)*a^2/(c^2*d)
```

Fricas [A]
time = 2.41, size = 147, normalized size = 1.01

$$-\frac{2\sqrt{-c^2dx^2+d}\,(b^2cx\arcsin(cx)+abcx)\sqrt{-c^2x^2+1}+\left((a^2-2b^2)c^2x^2+(b^2c^2x^2-b^2)\arcsin(cx)^2-a^2+2b^2+2(abc^2x^2-ab)\arcsin(cx)\right)\sqrt{-c^2dx^2+d}}{c^4dx^2-c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -(2*sqrt(-c^2*d*x^2 + d)*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt(-c^2*x^2 + 1)
 + ((a^2 - 2*b^2)*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 + 2*b^2
 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^4*d*x^2 - c^
2*d)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.239 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=49

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.038$, Rules used = $\{4737\}$

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d - c^2*d*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\ &= \frac{\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 64, normalized size = 1.31

$$\frac{\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\left(3a^2+3ab\text{ArcSin}(cx)+b^2\text{ArcSin}(cx)^2\right)}{3c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(3*a^2 + 3*a*b*ArcSin[c*x] + b^2*ArcSin[c*x]
^2))/(3*c*Sqrt[d - c^2*d*x^2])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 142 vs. $2(43) = 86$.
time = 0.08, size = 143, normalized size = 2.92

method	result
default	$\frac{a^2 \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{\sqrt{c^2 d}} - \frac{b^2 \sqrt{-d\left(c^2 x^2-1\right)}\, \sqrt{-c^2 x^2+1}\, \arcsin(cx)^3}{3cd(c^2x^2-1)} - \frac{ab\sqrt{-d\left(c^2x^2-1\right)}\, \sqrt{-c}}{cd(c^2x^2-}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/3*b^2*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^3-a*b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2
```

Maxima [A]
time = 0.50, size = 47, normalized size = 0.96

$$\frac{b^2 \arcsin{(cx)}^3}{3\,c\sqrt{d}} + \frac{ab \arcsin{(cx)}^2}{c\sqrt{d}} + \frac{a^2 \arcsin{(cx)}}{c\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*b^2*arcsin(c*x)^3/(c*sqrt(d)) + a*b*arcsin(c*x)^2/(c*sqrt(d)) + a^2*arc
sin(c*x)/(c*sqrt(d))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))^2}{\sqrt{d - c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(1/2), x)
```

3.240 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=257

$$-\frac{2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}+\frac{2ib\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-e^{i\text{ArcS}}\right.}{\sqrt{d-c^2dx^2}}$$

```
[Out] -2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/(-c^2*d*x^2+d)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)
^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*I*b*(a+b*arcsin(c*x))*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*
b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^
(1/2)+2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*
x^2+d)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}=0.172$, Rules used = {4803, 4268, 2611, 2320, 6724}

$$\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}+\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2
, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (2*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (
2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
```

```
- 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d-c^2dx^2}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\
&= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int (a+bx)^2\csc(x)\,dx, x, \sin^{-1}(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (\cdots\right.}{\cdots}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\cdots\right.}{\sqrt{d-c^2\cdots}}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\cdots\right.}{\sqrt{d-c^2\cdots}}\\
&= -\frac{2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}\cdots\right.}{\sqrt{d-c^2\cdots}}
\end{aligned}$$

Mathematica [A]
time = 0.40, size = 301, normalized size = 1.17

$$\frac{a^2\log(cx)}{\sqrt{d}}-\frac{a^2\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)}{\sqrt{d}}+\frac{2ab\sqrt{1-c^2x^2}\left(\text{ArcSin}(cx)\left(\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\log\left(1+e^{i\text{ArcSin}(cx)}\right)\right)+i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{d-c^2dx^2}}+\frac{b^2\sqrt{1-c^2x^2}\left(\text{ArcSin}(cx)^2\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\text{ArcSin}(cx)^2\log\left(1+e^{i\text{ArcSin}(cx)}\right)+2i\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-2i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)-2\text{PolyLog}\left(3,-e^{i\text{ArcSin}(cx)}\right)+2\text{PolyLog}\left(3,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (a^2*Log[c*x])/Sqrt[d] - (a^2*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/Sqrt[d]
 + (2*a*b*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[
1 + E^(I*ArcSin[c*x])]) + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E
^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2] + (b^2*Sqrt[1 - c^2*x^2]*(ArcSin[c*
x]^2*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])]
+ (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*Poly
Log[2, E^(I*ArcSin[c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[3,
 E^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2]
```

Maple [A]
time = 0.19, size = 387, normalized size = 1.51

method	result
default	$-\frac{a^2\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{\sqrt{d}}+\frac{b^2\sqrt{-c^2x^2+1}\sqrt{-d\left(c^2x^2-1\right)}\left(\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-ar
csin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*
polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2)))
/d/(c^2*x^2-1)-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(I*arcsin(
c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(
1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/
2)))/d/(c^2*x^2-1)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -a^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/sqrt(d) - sqrt
(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*
d*x^3 - d*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^3 - d*x), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{x\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\operatorname{asin}(c\,x))^2}{x\,\sqrt{d - c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(1/2)), x)
```

3.241 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=183

$$-\frac{ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{dx}+\frac{2bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\log}{\sqrt{d-c^2dx^2}}$$

```
[Out] -I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*b*c*(a+b
*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(-c^2*d
*x^2+d)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^
(1/2)/(-c^2*d*x^2+d)^(1/2)-(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x
```

Rubi [A]
time = 0.16, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used = {4771, 4721, 3798, 2221, 2317, 2438}

$$-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{dx}-\frac{ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}+\frac{2bc\sqrt{1-c^2x^2}\,\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(d*x) + (2*b*c*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (I*
b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x
^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{dx}+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\sin^{-1}(cx)}{x}\,dx}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{dx}+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,\right.}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{dx}-\frac{\left(4ibc\sqrt{1-\right.}{}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{dx}+\frac{2bc\sqrt{1-c^2}}{}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{dx}+\frac{2bc\sqrt{1-c^2}}{}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{dx}+\frac{2bc\sqrt{1-c^2}}{}$$

Mathematica [**A**]
time = 0.30, size = 159, normalized size = 0.87

$$-\frac{\sqrt{1-c^2x^2}\left(b^2\left(icx+\sqrt{1-c^2x^2}\right)\operatorname{ArcSin}(cx)^2+2b\operatorname{ArcSin}(cx)\left(a\sqrt{1-c^2x^2}-bcx\log\left(1-e^{2i\operatorname{ArcSin}(cx)}\right)\right)+a\left(a\sqrt{1-c^2x^2}-2bcx\log(cx)\right)+ib^2cx\operatorname{PolyLog}\left(2,e^{2i\operatorname{ArcSin}(cx)}\right)\right)}{x\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[1 - c^2*x^2]*(b^2*(I*c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*A
rcSin[c*x]*(a*Sqrt[1 - c^2*x^2] - b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])]) + a
*(a*Sqrt[1 - c^2*x^2] - 2*b*c*x*Log[c*x]) + I*b^2*c*x*PolyLog[2, E^((2*I)*A
rcSin[c*x])]))/(x*Sqrt[d - c^2*d*x^2]))
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 637 vs. 2(187) = 374.
time = 0.31, size = 638, normalized size = 3.49

method	result
default	$-\frac{a^2\sqrt{-c^2d\,x^2+d}}{dx}+\frac{ib^2\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)^2\sqrt{-c^2x^2+1}\,c}{(c^2x^2-1)d}-\frac{b^2\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)^2x}{(c^2x^2-1)d}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d/x*(-c^2*d*x^2+d)^(1/2)+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c
^2*x^2-1)/d*(-c^2*x^2+1)^(1/2)*c-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(
c^2*x^2-1)*x/d*c^2+b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/x/d
-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c*arcsin(c*x
)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/d/(c^2*x^2-1)*c*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c*polylog(2,-I*c*x-(-
c^2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*
x^2-1)*c*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d
*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c-2*a*b*(-d*(c^2*x^2-1))^(1/2
)*arcsin(c*x)/(c^2*x^2-1)*x/d*c^2+2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/
(c^2*x^2-1)/x/d-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-
1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] -((-1)^(-2*c^2*d*x^2 + 2*d)*sqrt(d)*log(-2*c^2*d + 2*d/x^2) + sqrt(d)*log(x
^2 - 1/c^2))*a*b*c/d + b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2/(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^2), x)/sqrt(d) - 2*sqrt(-c^2*d*x^2 +
 d)*a*b*arcsin(c*x)/(d*x) - sqrt(-c^2*d*x^2 + d)*a^2/(d*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^4 - d*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}{(cx)})^2}{x^2 \sqrt{-d(cx-1)(cx+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{x^2\,\sqrt{d - c^2\,d\,x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(1/2)), x)
```

3.242 $\int \frac{(a+b\textbf{ArcSin}(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=402

$$-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2\tanh^{-}}{\sqrt{d-c^2dx^2}}$$

```
[Out] -b*c*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/x/(-c^2*d*x^2+d)^(1/2)-c^2*(a+b*a
rcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*
x^2+d)^(1/2)-b^2*c^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d
*x^2+d)^(1/2)+I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-I*b*c^2*(a+b*arcsin(c*x))*polylog
(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-b^2*c^
2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1
/2)+b^2*c^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*
x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x^2
```

Rubi [A]
time = 0.29, antiderivative size = 402, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {4789, 4803, 4268, 2611, 2320, 6724, 4723, 272, 65, 214}

$$\frac{ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}-\frac{ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{b^2c^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}+\frac{b^2c^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d-c^2dx^2}}-\frac{b^2c^2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[d - c^2*d*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (
b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[d - c^2*d*x^2] +
 (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[d - c^2*d*x^2] - (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (b^2*c^2*Sqrt[1 - c^2*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (b^2*c^2*Sqrt[1 -
 c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
```

```
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2dx^2}+\frac{1}{2}c^2\int \frac{(a+b\sin^{-1}(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right.}{\sqrt{d-}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2\right.}{2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2dx^2}+\frac{\left(c^2\sqrt{1-c^2\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{2dx^2}-\frac{c^2\sqrt{1-c^2x^2}}{}$$

Mathematica [**A**]

time = 3.73, size = 487, normalized size = 1.21

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-4*a^2*Sqrt[d - c^2*d*x^2])/x^2 + 4*a^2*c^2*Sqrt[d]*Log[x] - 4*a^2*c^2*Sq
rt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*c^2*d^2*(1 - c^2*x^2)^(
3/2)*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c
*x]*Log[1 - E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] +
 (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[c*x])]
 + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2
)^(3/2) + (b^2*c^2*d^2*(1 - c^2*x^2)^(3/2)*(-4*ArcSin[c*x]*Cot[ArcSin[c*x]/
2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]^2*Log[1 - E^(I*ArcS
in[c*x])] - 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[ArcSin[c
*x]/2]] + (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (8*I)*ArcSin[c
*x]*PolyLog[2, E^(I*ArcSin[c*x])] - 8*PolyLog[3, -E^(I*ArcSin[c*x])] + 8*Po
lyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*ArcSin
[c*x]*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2)^(3/2))/(8*d)
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1106 vs. 2(406) = 812.
time = 0.33, size = 1107, normalized size = 2.75

method	result
default	$-\frac{a^{2} \sqrt{-c^{2} d\,x^{2}+d}}{2 d\,x^{2}}-\frac{a^{2} c^{2} \ln \left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)}{2 \sqrt{d}}-\frac{b^{2} \arcsin \left(c x \right)^{2} \sqrt{-d \left(c^{2} x^{2}-1\right)}\,c^{2}}{2 d \left(c^{2} x^{2}-1\right)}+\frac{b^{2} \arcsin(}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2/d/x^2*(-c^2*d*x^2+d)^(1/2)-1/2*a^2*c^2/d^(1/2)*ln((2*d+2*d^(1/2)*(
-c^2*d*x^2+d)^(1/2))/x)-1/2*b^2*arcsin(c*x)^2*(-d*(c^2*x^2-1))^(1/2)/d/(c^2
*x^2-1)*c^2+b^2*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x/d/(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)*c+1/2*b^2*arcsin(c*x)^2*(-d*(c^2*x^2-1))^(1/2)/x^2/d/(c^2*x^2-1)
+1/2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin
(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2)
)-I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(
c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2
*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+b^2*(
-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*polylog(3,-I*c*x
```

```
-(-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x
^2-1)*c^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))-a*b*
(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c^2+a*b*(-d*(c^2*x^2-1))^(
1/2)/x/d/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+a*b*arcsin(c*x)*(-d*(c^2*x^2-1))^
(1/2)/x^2/d/(c^2*x^2-1)+a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^
2*x^2-1)*c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-a*b*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x
^2+1)^(1/2))+I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*
c^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x
^2-1))^(1/2)/d/(c^2*x^2-1)*c^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/
2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] -1/2*(c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/sqrt(d) +
 sqrt(-c^2*d*x^2 + d)/(d*x^2))*a^2 - sqrt(d)*integrate((b^2*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^5 - d*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{x^3 \sqrt{-d (cx - 1) (cx + 1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^3\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(1/2)), x)
```

3.243 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=319

$$-\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3x^2\sqrt{d-c^2dx^2}}-\frac{2ic^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{3\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b}{3dx^3}$$

```
[Out] -1/3*b^2*c^2*(-c^2*x^2+1)/x/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a+b*arcsin(c*x))*
(-c^2*x^2+1)^(1/2)/x^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*c^3*(a+b*arcsin(c*x))^2*(
-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+4/3*b*c^3*(a+b*arcsin(c*x))*ln(1-(I*
c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2/3*I*b^
2*c^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^
2+d)^(1/2)-1/3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x^3-2/3*c^2*(a+b*
arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x
```

Rubi [A]
time = 0.28, antiderivative size = 319, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4789, 4771, 4721, 3798, 2221, 2317, 2438, 4723, 270}

$$-\frac{2c^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3dx}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3dx^3}-\frac{2ic^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{3\sqrt{d-c^2dx^2}}+\frac{4bc^3\sqrt{1-c^2x^2}\,\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3\sqrt{d-c^2dx^2}}-\frac{2ib^2c^3\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{3\sqrt{d-c^2dx^2}}-\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/3*(b^2*c^2*(1 - c^2*x^2))/(x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(3*x^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*c^3*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x])^2)/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*Arc
Sin[c*x])^2)/(3*d*x) + (4*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1
 - E^((2*I)*ArcSin[c*x])])/(3*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*c^3*Sqr
t[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
```

```
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{3dx^3} + \frac{1}{3}(2c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx + \frac{\Big(2bc\sqrt{1-c}}{3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^2}{3dx^3} - \frac{2c^2\sqrt{d-c^2d}}{}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx}{3dx^3}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{3\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 0.51, size = 269, normalized size = 0.84

$$-\frac{\sqrt{1-c^2x^2}\left(abcx+a^2\sqrt{1-c^2x^2}+2a^2c^2x^2\sqrt{1-c^2x^2}+b^2c^2x^2\sqrt{1-c^2x^2}+b^2\left(2ic^3x^3+\sqrt{1-c^2x^2}+2c^2x^2\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)^2-b\mathrm{ArcSin}(cx)\left(-bcx-2a\sqrt{1-c^2x^2}\,(1+2c^2x^2)+4bc^3x^3\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)\right)-4abc^3x^3\log(cx)+2ib^2c^3x^3\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)}{3x^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/3*(Sqrt[1 - c^2*x^2]*(a*b*c*x + a^2*Sqrt[1 - c^2*x^2] + 2*a^2*c^2*x^2*Sq
rt[1 - c^2*x^2] + b^2*c^2*x^2*Sqrt[1 - c^2*x^2] + b^2*((2*I)*c^3*x^3 + Sqrt
[1 - c^2*x^2] + 2*c^2*x^2*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - b*ArcSin[c*x]*
(-(b*c*x) - 2*a*Sqrt[1 - c^2*x^2]*(1 + 2*c^2*x^2) + 4*b*c^3*x^3*Log[1 - E^(
(2*I)*ArcSin[c*x])]) - 4*a*b*c^3*x^3*Log[c*x] + (2*I)*b^2*c^3*x^3*PolyLog[2
, E^((2*I)*ArcSin[c*x])]))/(x^3*Sqrt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2318 vs. $2(301) = 602$.
time = 0.56, size = 2319, normalized size = 7.27

method	result	size
default	Expression too large to display	2319

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^5*c^8-1/3*b^2*(
-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6+2/3*b^2*(-d*(c^2*x^
2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/
(3*c^4*x^4-2*c^2*x^2-1)/d/x*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2
*c^2*x^2-1)/d/x^3*arcsin(c*x)^2+a^2*(-1/3/d/x^3*(-c^2*d*x^2+d)^(1/2)-2/3*c^
2/d/x*(-c^2*d*x^2+d)^(1/2))-4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c
^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6-2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^
4-2*c^2*x^2-1)/d*x*(-c^2*x^2+1)*c^4-4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4
*x^4-2*c^2*x^2-1)/d*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+8/3*I*a*b*(-c^2*x^2+
1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c^3+2/3*I*a*b*(-d
*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^4-4/3*I*a*b*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^5*c^8-4*a*b*(-d*(c^2*x^2-1))^(1/2)/(3
*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)*c^6+2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2
)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x
^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^4+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x
^4-2*c^2*x^2-1)/d/x*arcsin(c*x)*c^2+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x
^4-2*c^2*x^2-1)/d/x^2*(-c^2*x^2+1)^(1/2)*c-4/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(
c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^3+a*b*
(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*x^2+1)^(1/2)*c^3+2/3
*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(c*x)+4/3*b
^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)^2*c^2+b^2
*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*arcsin(c*x)*(-c^2*x^2+1)^
(1/2)*c^3-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*
x^2+1)^(1/2)*c^3-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x
^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c
^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)*(-c^2*x^2+1)*c^6-2*I*b^2*(-d*(c^2*x^2
-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^2*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c
^5-2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)
*(-c^2*x^2+1)*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/
x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c-I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^
4-2*c^2*x^2-1)/d*x^2*(-c^2*x^2+1)^(1/2)*c^5+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2
)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^4+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*
(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*arcsin(c*x)^2-4/3*b^2*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*arcsin(c*x)*ln(1+I*c*x+(-c^
```

```
2*x^2+1)^(1/2))-4/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^
2-1)*c^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2/3*I*b^2*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)*c^6+4/3*I*b^2*(-c^2*x^2
+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*polylog(2,-I*c*x-(-c^2*x
^2+1)^(1/2))+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2
-1)*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2
)/(3*c^4*x^4-2*c^2*x^2-1)/d*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3-4/3*I*b^2*
(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^5*arcsin(c*x)*c^8-2/3*b^
2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6-2*b
^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)^2*c^6+1
/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)^2*c^4
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] 1/3*(4*c^2*log(x)/sqrt(d) - 1/(sqrt(d)*x^2))*a*b*c - 2/3*a*b*(2*sqrt(-c^2*d
*x^2 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3))*arcsin(c*x) - 1/3*a^2*(
2*sqrt(-c^2*d*x^2 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3)) + b^2*inte
grate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/(sqrt(c*x + 1)*sqrt(-c*x
 + 1)*x^4), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^6 - d*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{x^4\sqrt{-d(cx-1)(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^4\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(1/2)), x)
```

3.244 $\int \frac{x^5(a+b\text{ArcSin}(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=549

$$-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}-\frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)^2}{27c^6d\sqrt{d-c^2dx^2}}-\frac{16b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}\,(a}{c^5d\sqrt{d-}}$$

```
[Out] -32/9*b^2*(-c^2*x^2+1)/c^6/d/(-c^2*d*x^2+d)^(1/2)+2/27*b^2*(-c^2*x^2+1)^2/c
^6/d/(-c^2*d*x^2+d)^(1/2)+x^4*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2
)-16/3*a*b*x*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)-16/3*b^2*x*arcsi
n(c*x)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)+2*b*x*(a+b*arcsin(c*x)
)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)-2/9*b*x^3*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*arcsin(c*x))*arct
an(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^6/d/(-c^2*d*x^2+d)^(1/2)-
2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^6/d/(
-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x
^2+1)^(1/2)/c^6/d/(-c^2*d*x^2+d)^(1/2)+8/3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+
d)^(1/2)/c^6/d^2+4/3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A]

time = 0.52, antiderivative size = 549, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 12, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {4791, 4795, 4767, 4715, 267, 4723, 272, 45, 4749, 4266, 2317, 2438}

$$\frac{4ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^6d\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{8\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3c^6d^2}+\frac{2bx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c^5d\sqrt{d-c^2dx^2}}+\frac{4x^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3c^4d^2}-\frac{2bx^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^3d\sqrt{d-c^2dx^2}}-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}-\frac{16b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2b^2\left(1-c^2x^2\right)^2}{27c^6d\sqrt{d-c^2dx^2}}-\frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d*Sqrt[d - c^2*d*x^2]) - (32*b^2*(1 -
c^2*x^2))/(9*c^6*d*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^2)/(27*c^6*d
*Sqrt[d - c^2*d*x^2]) - (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d*S
qrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d*
Sqrt[d - c^2*d*x^2]) - (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c
^3*d*Sqrt[d - c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2
*d*x^2]) + (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^2) + (4*x
^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2) + ((4*I)*b*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d -
c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c^6*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I
*E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^5(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x^4(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{4\int \frac{x^3(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^4(a+b\sin^{-1}}{1-c^2x^2}}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{2bx^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3c^3d\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4x^2\sqrt{d-c^2dx^2}\,(a}{3c^4d}$$

$$= \frac{2bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d\sqrt{d-c^2dx^2}} - \frac{2bx^3\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4(a+}{c^2d\sqrt{}}$$

$$= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^6d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^5d\sqrt{d-c^2dx^2}} - $$

$$= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} + \frac{8b^2(1-c^2x^2)}{3c^6d\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)^2}{9c^6d\sqrt{d-c^2dx^2}} - \frac{16b^2x\sqrt{1-c^2}}{3c^5d\sqrt{d-}}$$

$$= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} - \frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^2}{27c^6d\sqrt{d-c^2dx^2}} - \frac{16b^2x\sqrt{1-c}}{3c^5d\sqrt{d}}$$

$$= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} - \frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^2}{27c^6d\sqrt{d-c^2dx^2}} - \frac{16b^2x\sqrt{1-c}}{3c^5d\sqrt{d}}$$

<u>Mathematica</u> [A]
time = 0.47, size = 453, normalized size = 0.83

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (576*a^2 - 378*b^2 - 288*a^2*c^2*x^2 - 72*a^2*c^4*x^4 + 810*a*b*ArcSin[c*x]
 + 405*b^2*ArcSin[c*x]^2 - 376*b^2*Cos[2*ArcSin[c*x]] + 360*a*b*ArcSin[c*x]
*Cos[2*ArcSin[c*x]] + 180*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + 2*b^2*Cos[
4*ArcSin[c*x]] - 18*a*b*ArcSin[c*x]*Cos[4*ArcSin[c*x]] - 9*b^2*ArcSin[c*x]^
2*Cos[4*ArcSin[c*x]] - 432*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I
*ArcSin[c*x])] + 432*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSi
n[c*x])] + 432*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] - 432*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2]] - (432*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (
432*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 372*a*b*Sin[
2*ArcSin[c*x]] - 372*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 6*a*b*Sin[4*ArcSi
```

```
n[c*x]] + 6*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]])/(216*c^6*d*Sqrt[d - c^2*d*x
^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1086 vs. $2(516) = 1032$.
time = 0.62, size = 1087, normalized size = 1.98

method	result
default	$a^2\left(-\frac{x^4}{3c^2d\sqrt{-c^2d\,x^2+d}}+\frac{-\frac{4x^2}{3c^2d\sqrt{-c^2d\,x^2+d}}+\frac{8}{3d\,c^4\sqrt{-c^2d\,x^2+d}}}{c^2}\right)-\frac{b^2\sqrt{-d\left(c^2x^2-1\right)}\,\mathrm{arcsin}(}{36d^2c^6(c^2x^2-1}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/3*x^4/c^2/d/(-c^2*d*x^2+d)^(1/2)+4/3/c^2*(-x^2/c^2/d/(-c^2*d*x^2+d)
^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2)))-1/36*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/c
^6/(c^2*x^2-1)*arcsin(c*x)*sin(4*arcsin(c*x))-94/27*b^2*(-d*(c^2*x^2-1))^(1
/2)/d^2/c^4/(c^2*x^2-1)*x^2-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)
/d^2/c^6/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(
-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*arcsin(c*x)*ln
(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)/d^2/c^6/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*b^2*(
-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*dilog(1+I*(I*c
*x+(-c^2*x^2+1)^(1/2)))+31/9*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/c^5/(c^2*x^2-1)
*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-65/24*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/
(c^2*x^2-1)*arcsin(c*x)^2+377/108*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x
^2-1)+5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/c^4/(c^2*x^2-1)*arcsin(c*x)^2*x^2-
1/108*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*cos(4*arcsin(c*x))+1/2
4*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*cos(4*arcsin(c*x))*arcsin(
c*x)^2+10/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^4/(c^2*x^2-1)*arcsin(c*x)*x^2-
65/12*a*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*arcsin(c*x)+2*a*b*(-c^
2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^
2+1)^(1/2)+I)-1/36*a*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*sin(4*arc
sin(c*x))+1/12*a*b*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(c^2*x^2-1)*arcsin(c*x)*c
os(4*arcsin(c*x))-2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^6/(
c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+31/9*a*b*(-d*(c^2*x^2-1))^(1/2)/d
^2/c^5/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] -1/3*a^2*(x^4/(sqrt(-c^2*d*x^2 + d)*c^2*d) + 4*x^2/(sqrt(-c^2*d*x^2 + d)*c^
4*d) - 8/(sqrt(-c^2*d*x^2 + d)*c^6*d)) + 1/3*((b^2*c^4*x^4 + 4*b^2*c^2*x^2
- 8*b^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))^2 + 3*(c^8*d^2*x^2 - c^6*d^2)*integrate(2/3*(3*sqrt(c*x + 1)*
sqrt(-c*x + 1)*a*b*c^5*sqrt(d)*x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) - (b^2*c^6*x^6 + 3*b^2*c^4*x^4 - 12*b^2*c^2*x^2 + 8*b^2)*sqrt(d)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^9*d^2*x^4 - 2*c^7*d^2*x^2 + c^5*d^2
), x))/(c^8*d^2*x^2 - c^6*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^5*arcsin(c*x)^2 + 2*a*b*x^5*arcsin(c*x) + a^2*x^5)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5 (a + b \operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.245 $\int \frac{x^4(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=424

$$-\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}}+\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c^5d\sqrt{d-c^2dx^2}}-\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2c^3d\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-$$

```
[Out] -1/4*b^2*x*(-c^2*x^2+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)+x^3*(a+b*arcsin(c*x))^2/
c^2/d/(-c^2*d*x^2+d)^(1/2)+1/4*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c
^2*d*x^2+d)^(1/2)-1/2*b*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^
2*d*x^2+d)^(1/2)-I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2
+d)^(1/2)-1/2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^5/d/(-c^2*d*x^2+d)
^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1
)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/
2))^2)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)+3/2*x*(a+b*arcsin(c*x)
)^2*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A]
time = 0.43, antiderivative size = 424, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4791, 4795, 4737, 4723, 327, 222, 4765, 3800, 2221, 2317, 2438}

$$\frac{x^3(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{c^5d\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^5d\sqrt{d-c^2dx^2}}+\frac{3x\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2c^4d^2}-\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2c^3d\sqrt{d-c^2dx^2}}-\frac{ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}}+\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c^5d\sqrt{d-c^2dx^2}}-\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -1/4*(b^2*x*(1 - c^2*x^2))/(c^4*d*Sqrt[d - c^2*d*x^2]) + (b^2*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(4*c^5*d*Sqrt[d - c^2*d*x^2]) - (b*x^2*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x]))/(2*c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x
])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)^2)/(c^5*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^2)/(2*c^4*d^2) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c^5*d*
Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E
^((2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^
2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
```

```
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x^3(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{3\int \frac{x^2(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\sin^{-1}(c\cdots}{1-c^2x^2}}{cd\sqrt{d-c^2dx^2}}\cdots$$

$$= \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}\,(a+b\cdots}{2c^4d^2}\cdots$$

$$= \frac{b^2x(1-c^2x^2)}{2c^4d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \cdots$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{2c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\cdots}{2c^3d\sqrt{d-c^2dx^2}}\cdots$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\cdots}{2c^3d\sqrt{d-c^2dx^2}}\cdots$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\cdots}{2c^3d\sqrt{d-c^2dx^2}}\cdots$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\cdots}{2c^3d\sqrt{d-c^2dx^2}}\cdots$$

Mathematica [**A**]
time = 1.46, size = 312, normalized size = 0.74

$$\frac{-4a^2c\sqrt{d}\,x(-3+c^2x^2)+12a^2\sqrt{d-c^2dx^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+2ab\sqrt{d}\left(8cx\mathrm{ArcSin}(cx)+\sqrt{1-c^2x^2}\left(-6\mathrm{ArcSin}(cx)^2+\cos(2\mathrm{ArcSin}(cx))+4\log(1-c^2x^2)+2\mathrm{ArcSin}(cx)\sin(2\mathrm{ArcSin}(cx))\right)\right)+b^2\sqrt{d}\left(8cx\mathrm{ArcSin}(cx)^2-8i\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\mathrm{ArcSin}(cx)}\right)+\sqrt{1-c^2x^2}\left(-4\mathrm{ArcSin}(cx)^3+2\mathrm{ArcSin}(cx)\left(\cos(2\mathrm{ArcSin}(cx))+8\log\left(1+e^{2i\mathrm{ArcSin}(cx)}\right)\right)-\sin(2\mathrm{ArcSin}(cx))+2\mathrm{ArcSin}(cx)^2(-4i+\sin(2\mathrm{ArcSin}(cx)))\right)\right)}{8c^5d^{3/2}\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a^2*c*Sqrt[d]*x*(-3 + c^2*x^2) + 12*a^2*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x
*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 2*a*b*Sqrt[d]*(8*c*x*ArcS
in[c*x] + Sqrt[1 - c^2*x^2]*(-6*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 4*Log[
1 - c^2*x^2] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])) + b^2*Sqrt[d]*(8*c*x*ArcS
in[c*x]^2 - (8*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + Sq
rt[1 - c^2*x^2]*(-4*ArcSin[c*x]^3 + 2*ArcSin[c*x]*(Cos[2*ArcSin[c*x]] + 8*L
og[1 + E^((2*I)*ArcSin[c*x])]) - Sin[2*ArcSin[c*x]] + 2*ArcSin[c*x]^2*(-4*I
 + Sin[2*ArcSin[c*x]]))))/(8*c^5*d^(3/2)*Sqrt[d - c^2*d*x^2])
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 972 vs. $2(402) = 804$.
time = 0.59, size = 973, normalized size = 2.29

method	result
default	$-\frac{a^2x^3}{2c^2d\sqrt{-c^2d\,x^2+d}}+\frac{3a^2x}{2c^4d\sqrt{-c^2d\,x^2+d}}-\frac{3a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^4d\sqrt{c^2d}}+\frac{b^2\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-}}{2c^5d^2(c^2x}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2*x^3/c^2/d/(-c^2*d*x^2+d)^(1/2)+3/2*a^2/c^4*x/d/(-c^2*d*x^2+d)^(1/2
)-3/2*a^2/c^4/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+
1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsi
n(c*x)^3-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1
)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^2*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))^2)+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-
1)*arcsin(c*x)-1/8*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c
^2*x^2-1)*arcsin(c*x)-9/8*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*x*
arcsin(c*x)^2+1/16*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*x-1/8*b^2
*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*cos(3*arcsin(c*x))-
1/8*b^2*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*sin(3*arcsin(c*x))*arcsi
n(c*x)^2+1/16*b^2*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*sin(3*arcsin(c
*x))+3/2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*
arcsin(c*x)^2+I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*
x^2-1)*arcsin(c*x)^2-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^
2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/8*a*b*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)-9/4*a*b*(-d*(c^2*x^2-1))^(1/2)/
c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*x-1/8*a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c
^2*x^2-1)*cos(3*arcsin(c*x))-1/4*a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^
2-1)*arcsin(c*x)*sin(3*arcsin(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] -1/2*a^2*(x^3/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 3*x/(sqrt(-c^2*d*x^2 + d)*c^4*
d) + 3*arcsin(c*x)/(c^5*d^(3/2))) + sqrt(d)*integrate((b^2*x^4*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^4*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d
^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a + b\operatorname{asin}(cx))^2}{(-d(cx - 1)(cx + 1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.246 $\int \frac{x^3(a+b\textbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=412

$$-\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}}-\frac{4b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{c^3d\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c^3d\sqrt{d-c^2dx^2}}+\frac{x^2(a}{c}$$

```
[Out] -2*b^2*(-c^2*x^2+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)+x^2*(a+b*arcsin(c*x))^2/c^2/
d/(-c^2*d*x^2+d)^(1/2)-4*a*b*x*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2
)-4*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+2*b*x*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*a
rcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2
*d*x^2+d)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+
1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)
^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*(a+b*arcsin(c*x))^
2*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A]
time = 0.32, antiderivative size = 412, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4791, 4767, 4715, 267, 4795, 4749, 4266, 2317, 2438}

$$\frac{4ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^4d\sqrt{d-c^2dx^2}}+\frac{x^2(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{c^4d^2}+\frac{2bx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c^3d\sqrt{d-c^2dx^2}}-\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}-\frac{4b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{c^3d\sqrt{d-c^2dx^2}}-\frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a*b*x*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*
x^2))/(c^4*d*Sqrt[d - c^2*d*x^2]) - (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])
/(c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(c^3*d*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d -
 c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^4*d^2) + ((
4*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^
4*d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
```

```
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x^2(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{2\int \frac{x(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\sin^{-1}(c\cdots}{1-c^2x^2}\cdots}{cd\sqrt{d-c^2dx^2}\cdots}$$

$$= \frac{2bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}\,(a+\cdots}{c^4d^2\cdots}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2\cdots}{\cdots}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-\cdots}}{\cdots}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-\cdots}}{\cdots}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-\cdots}}{\cdots}$$

Mathematica [A]
time = 0.36, size = 369, normalized size = 0.90

$$\frac{4a^2-2b^2-2a^2c^2x^2+6ab\text{ArcSin}(cx)+3b^2\text{ArcSin}(cx)^2-2b^2\cos(2\text{ArcSin}(cx))+2ab\text{ArcSin}(cx)\cos(2\text{ArcSin}(cx))+b^2\text{ArcSin}(cx)^2\cos(2\text{ArcSin}(cx))-4b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)+4b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+4ab\sqrt{1-c^2x^2}\,\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-4ab\sqrt{1-c^2x^2}\,\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)-2ab\sin(2\text{ArcSin}(cx))-2b^2\text{ArcSin}(cx)\sin(2\text{ArcSin}(cx))}{2c^4d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (4*a^2 - 2*b^2 - 2*a^2*c^2*x^2 + 6*a*b*ArcSin[c*x] + 3*b^2*ArcSin[c*x]^2 -
2*b^2*Cos[2*ArcSin[c*x]] + 2*a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + b^2*ArcSi
n[c*x]^2*Cos[2*ArcSin[c*x]] - 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I
*E^(I*ArcSin[c*x])] + 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*Ar
cSin[c*x])] + 4*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c
*x]/2]] - 4*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]] - (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I
)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*a*b*Sin[2*ArcSi
n[c*x]] - 2*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(2*c^4*d*Sqrt[d - c^2*d*x^2
])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 828 vs. $2(401) = 802$.
time = 0.40, size = 829, normalized size = 2.01

method	result
default	$a^2\left(-\frac{x^2}{c^2 d\sqrt{-c^2 d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2 d\,x^2+d}}\right)+\frac{2b^2\sqrt{-d\,(c^2x^2-1)}\,\arcsin(cx)\sqrt{-c^2x^2+1}\,x}{c^3d^2(c^2x^2-1)}+\frac{b^2\sqrt{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2))+2*b^2*(-
d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x+b
^2*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^2-2*b^2*(-d*(
c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*x^2-2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/
d^2/(c^2*x^2-1)*arcsin(c*x)^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2
-1)+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*d
ilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*b^2
*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*
ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+
2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+2*a*b
*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2-4*a*b*(-d*(c^2*
x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)-2*a*b*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+2*a*b
*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(-c
^2*x^2+1)^(1/2)+I)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] -a*b*c*(2*x/(c^4*d^(3/2)) + log(c*x + 1)/(c^5*d^(3/2)) - log(c*x - 1)/(c^5*
d^(3/2))) - 2*a*b*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 +
d)*c^4*d))*arcsin(c*x) - a^2*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c
^2*d*x^2 + d)*c^4*d)) + ((c^2*x^2 - 2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - (c^6*d^2*x^2 - c^4*d^2)*sqr
t(d)*integrate(2*(c^2*x^4 - 2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))/(c^3*d^2*x^2 - c*d^2), x))*b^2/(c^6*d^2*x^2 - c^4*d^2)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.247 $\int \frac{x^2(a+b\mathbf{ArcSin}(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=250

$$\frac{x(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{c^3d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\,(a+$$

```
[Out] x*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*(a+b*arcsin(c*x))^2*(-c^
2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2
+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-
c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*po
lylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2
+d)^(1/2)
```

Rubi [A]
time = 0.23, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.241$, Rules used = {4791, 4737, 4765, 3800, 2221, 2317, 2438}

$$\frac{x(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{c^3d\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3d\sqrt{d-c^2dx^2}}-\frac{ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2)/(c^3*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^3)/(3*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2
*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^
3*d*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(cx))}{1-c^2x^2}\,d}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \sin^{-1}(cx\right.}{c^3d\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{3bc^3d\sqrt{d-c^2dx}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{3bc^3d\sqrt{d-c^2dx}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{3bc^3d\sqrt{d-c^2dx}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{3bc^3d\sqrt{d-c^2dx}}$$

Mathematica [A]
time = 0.37, size = 295, normalized size = 1.18

$$-\frac{a^2x\sqrt{-d(-1+c^2x^2)}}{c^2d^2(-1+c^2x^2)} + \frac{a^2\mathrm{ArcTan}\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right)}{c^3d^{3/2}} + \frac{ab\left(2cx\mathrm{ArcSin}(cx) - \sqrt{1-c^2x^2}\left(\mathrm{ArcSin}(cx)^2 - 2\log\left(\sqrt{1-c^2x^2}\right)\right)\right)}{c^3d\sqrt{d(1-c^2x^2)}} + \frac{b^2\left(\mathrm{ArcSin}(cx)\left(3cx\mathrm{ArcSin}(cx) - \sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)(3i+\mathrm{ArcSin}(cx)) + 6\sqrt{1-c^2x^2}\log\left(1+e^{2i\mathrm{ArcSin}(cx)}\right)\right) - 3i\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\mathrm{ArcSin}(cx)}\right)\right)}{3c^3d\sqrt{d(1-c^2x^2)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((a^2*x*Sqrt[-(d*(-1 + c^2*x^2))])/(c^2*d^2*(-1 + c^2*x^2))) + (a^2*ArcTan
[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^3*d^(3/2)) +
 (a*b*(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2 - 2*Log[Sqrt[1
- c^2*x^2]])))/(c^3*d*Sqrt[d*(1 - c^2*x^2)]) + (b^2*(ArcSin[c*x]*(3*c*x*Arc
Sin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(3*I + ArcSin[c*x]) + 6*Sqrt[1 - c
^2*x^2]*Log[1 + E^((2*I)*ArcSin[c*x])]) - (3*I)*Sqrt[1 - c^2*x^2]*PolyLog[2
, -E^((2*I)*ArcSin[c*x])]))/(3*c^3*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 580 vs. 2(248) = 496.
time = 0.26, size = 581, normalized size = 2.32

method	result

default	$\frac{a^2x}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}}+\frac{b^2\sqrt{-d\,(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3d^2c^3(c^2x^2-1)}+\frac{ib^2\sqrt{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*x/c^2/d/(-c^2*d*x^2+d)^(1/2)-a^2/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/
2)*x/(-c^2*d*x^2+d)^(1/2))+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)^3+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x
)^2/d^2/c^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsi
n(c*x)^2/d^2/c^2/(c^2*x^2-1)*x-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1
/2)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^
2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^3/(c^2*x^2-1)*polylog(2,-
(I*c*x+(-c^2*x^2+1)^(1/2))^2)+a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)^2+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-
1))^(1/2)/d^2/c^3/(c^2*x^2-1)*arcsin(c*x)-2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcs
in(c*x)/d^2/c^2/(c^2*x^2-1)*x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)/d^2/c^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] a^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + sqrt(d)*
integrate((b^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^2
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(
c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 (a + b \operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{asin}(c\,x)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.248 $\int \frac{x(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=208

$$\frac{(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{4ib\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{iA\ldots}\right.}{c^2d\sqrt{d-c^2dx^2}}$$

```
[Out] (a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*arcsin(c*x))*arct
an(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)-
2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/(
-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x
^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {4767, 4749, 4266, 2317, 2438}

$$\frac{4ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^2d\sqrt{d-c^2dx^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^
2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2
*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
```

```
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{a+b\sin^{-1}(cx)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}\\
&= \frac{(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\sin^{-1}(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}\\
&= \frac{(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(2b^2\right.}{}\\
&= \frac{(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2ib\right.}{}\\
&= \frac{(a+b\sin^{-1}(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{2ib^2}{}
\end{aligned}$$

Mathematica [A]
time = 0.32, size = 276, normalized size = 1.33

$$\frac{a^2+2ab\text{ArcSin}(cx)+b^2\text{ArcSin}(cx)^2-2b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)+2b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+2ab\sqrt{1-c^2x^2}\,\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-2ab\sqrt{1-c^2x^2}\,\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a^2 + 2*a*b*ArcSin[c*x] + b^2*ArcSin[c*x]^2 - 2*b^2*Sqrt[1 - c^2*x^2]*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*
Log[1 + I*E^(I*ArcSin[c*x])] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/
2] - Sin[ArcSin[c*x]/2]] - 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])] + (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(
c^2*d*Sqrt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 539 vs. $2(213) = 426$.
time = 0.15, size = 540, normalized size = 2.60

method	result
default	$\frac{a^{2}}{c^{2} d \sqrt{-c^{2} d \,x^{2}+d}}-\frac{b^{2} \sqrt{-d \left(c^{2} x^{2}-1\right)}\, \arcsin \left(c x \right)^{2}}{c^{2} d^{2} \left(c^{2} x^{2}-1\right)}-\frac{2 b^{2} \sqrt{-c^{2} x^{2}+1}\, \sqrt{-d \left(c^{2} x^{2}-1\right)}\, \arcsin \left(c x \right) \ln \left(1+\right.}{c^{2} d^{2} \left(c^{2} x^{2}-1\right)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2/c^2/d/(-c^2*d*x^2+d)^(1/2)-b^2*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-
1)*arcsin(c*x)^2-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c
^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2
/d^2/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*b^2*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^
2+1)^(1/2)))-2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)-2
*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*ln(I*c*x
+(-c^2*x^2+1)^(1/2)-I)+2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/
d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] sqrt(d)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a
*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x) + a^2/(sqrt(-c^2*d*x^2 + d)*c^2*
d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
a^2*x)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.249 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=195

$$\frac{x(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{cd\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\log\left(1+e^{2i\text{ArcSin}(cx)}\right)}{cd\sqrt{d-c^2dx^2}}$$

```
[Out] x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)-I*(a+b*arcsin(c*x))^2*(-c^2*x^
2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*polylog
(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/
2)
```

Rubi [A]
time = 0.12, antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {4745, 4765, 3800, 2221, 2317, 2438}

$$\frac{x(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{cd\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{cd\sqrt{d-c^2dx^2}}-\frac{ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{cd\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(c*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])
- (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d
- c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(cx))}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx, x, \sin^{-1}(cx)\right)}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\right.}{cd\sqrt{d}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{cd\sqrt{d}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{cd\sqrt{d}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{cd\sqrt{d}}$$

Mathematica [A]
time = 0.26, size = 165, normalized size = 0.85

$$\frac{b^2\left(cx-i\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)^2+2b\text{ArcSin}(cx)\left(acx+b\sqrt{1-c^2x^2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)\right)+a\left(acx+b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)\right)-ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)}{cd\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (b^2*(c*x - I*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*ArcSin[c*x]*(a*c*x + b
*Sqrt[1 - c^2*x^2]*Log[1 + E^((2*I)*ArcSin[c*x])]) + a*(a*c*x + b*Sqrt[1 -
c^2*x^2]*Log[1 - c^2*x^2]) - I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*A
rcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 424 vs. 2(199) = 398.
time = 0.12, size = 425, normalized size = 2.18

method	result
default	$\frac{a^2 x}{d\sqrt{-c^2 d\,x^2+d}}+\frac{i b^2\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)^2\sqrt{-c^2x^2+1}}{c\,d^2\left(c^2x^2-1\right)}-\frac{b^2\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)^2 x}{d^2\left(c^2x^2-1\right)}-\frac{2b}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*x/d/(-c^2*d*x^2+d)^(1/2)+I*b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/c/d
^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-b^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/
d^2/(c^2*x^2-1)*x-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^
2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*b^2*(-c^2*x^2+1)^
(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^2*x^2-1)*polylog(2,-(I*c*x+(-c^2*x^2+
1)^(1/2))^2)+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^2*x
^2-1)*arcsin(c*x)-2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/(c^2*x^2-1)*
x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^2/(c^2*x^2-1)*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 2*a*b*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) - b^2*integrate(arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1
```

```
)), x)/sqrt(d) + a^2*x/(sqrt(-c^2*d*x^2 + d)*d) - a*b*log(x^2 - 1/c^2)/(c*d
^(3/2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{(-d(cx - 1)(cx + 1))^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{(d - c^2\,d\,x^2)^{3/2}} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(3/2),x)
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(3/2), x)
```

3.250 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=467

$$\frac{(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}+\frac{4ib\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2\,\text{t}}{d\sqrt{d-c^2dx^2}}$$

```
[Out] (a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*arcsin(c*x))*arctan(I
*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2*(a+b*a
rcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*
d*x^2+d)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))
*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^
2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(
2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2
*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/
2)/d/(-c^2*d*x^2+d)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*
x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.34, antiderivative size = 467, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438}

$$\frac{4ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqr
t[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[
2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x
^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]
) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c
*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*
ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3
, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx = \frac{(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx}{d} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\sin^{-1}(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\mathrm{Subst}(\int}{d\sqrt{c}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-}}{}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-}}{}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-}}{}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-}}{}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-}}{}$$

<u>Mathematica</u> [A]
time = 1.11, size = 667, normalized size = 1.43

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a^2*d + a^2*Sqrt[d]*Sqrt[d - c^2*d*x^2]*Log[c*x] - a^2*Sqrt[d]*Sqrt[d - c^
2*d*x^2]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + 2*a*b*d*(ArcSin[c*x] + Sqrt
[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*Ar
cSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2]] + I*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*S
qrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])]) + b^2*d*(ArcSin[c*x]^2 + Sq
rt[1 - c^2*x^2]*ArcSin[c*x]^2*Log[1 - E^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x
^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*ArcSin[c
*x]*Log[1 + I*E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*Log[1 +
E^(I*ArcSin[c*x])] + (2*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, -E^(I*A
rcSin[c*x])] - (2*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
```

```
(2*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c
^2*x^2]*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x^2]*Pol
yLog[3, -E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*
x])]))/(d^2*Sqrt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1095 vs. $2(490) = 980$.
time = 0.28, size = 1096, normalized size = 2.35

method	result
default	$\frac{a^2}{d\sqrt{-c^2 d\,x^2+d}}-\frac{a^2\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2 d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}-\frac{b^2\sqrt{-d\left(c^2x^2-1\right)}\,\arcsin(cx)^2}{d^2(c^2x^2-1)}+\frac{b^2\sqrt{-c^2x^2+1}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2/d/(-c^2*d*x^2+d)^(1/2)-a^2/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/
2))/x)-b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)^2+b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x
+(-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2
*x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x
^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-
1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*b^2*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2
)))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog
(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)/d^2/(c^2*x^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(
1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1
/2))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcs
in(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d
*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2
*a*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)+2*a*b*(-c^2*x^2+1)^
(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x
^2+1)^(1/2))-4*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2
-1)*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/d^2/(c^2*x^2-1)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*
c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -a^2*(log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2) - 1/(
sqrt(-c^2*d*x^2 + d)*d)) + sqrt(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqr
t(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{x \left(-d \left(cx - 1\right) \left(cx + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{x\,(d - c^2\,d\,x^2)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(3/2)), x)
```

3.251 $\int \frac{(a+b\textbf{ArcSin}(cx))^2}{x^2(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=333

$$-\frac{(a+b\text{ArcSin}(cx))^2}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{2ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{4bc\sqrt{1-c^2x^2}\,(a+b\text{Ar}}{d\sqrt{}}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2*x*(a+b*arcsin(c*x))^2/d
/(-c^2*d*x^2+d)^(1/2)-2*I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(-c^2*
d*x^2+d)^(1/2)-4*b*c*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2
)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+4*b*c*(a+b*arcsin(c*x))*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-I*b^2
*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^
2+d)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/
2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.32, antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {4789, 4745, 4765, 3800, 2221, 2317, 2438, 4769, 4504, 4268}

$$\frac{2c^2x(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{2ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{dx\sqrt{d-c^2dx^2}}+\frac{4bc\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{4bc\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])^2/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin
[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (4*b*c*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*Sqrt[
d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*
x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2
*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^{3/2}}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{dx\sqrt{d-c^2dx^2}} + (2c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}}{x(1-c}}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (a+bx\right.}{d\sqrt{d-}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{\left(4bc\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (a+bx\right.}{d\sqrt{d-c^2d}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{d\sqrt{d-c^2dx^2}}$$

Mathematica [A]
time = 0.50, size = 322, normalized size = 0.97

$$\frac{-a^2+2a^2c^2x^2-2ab\mathrm{ArcSin}(cx)+4abc^2x^2\mathrm{ArcSin}(cx)-b^2\mathrm{ArcSin}(cx)^2+2b^2c^2x^2\mathrm{ArcSin}(cx)^2-2ib^2cx\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)^2+2b^2cx\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)+2b^2cx\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)\log\left(1+e^{2i\mathrm{ArcSin}(cx)}\right)+2abcx\sqrt{1-c^2x^2}\,\log(cx)+abcx\sqrt{1-c^2x^2}\,\log\left(1-c^2x^2\right)-ib^2cx\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\mathrm{ArcSin}(cx)}\right)-ib^2cx\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)}{dx\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-a^2 + 2*a^2*c^2*x^2 - 2*a*b*ArcSin[c*x] + 4*a*b*c^2*x^2*ArcSin[c*x] - b^2
*ArcSin[c*x]^2 + 2*b^2*c^2*x^2*ArcSin[c*x]^2 - (2*I)*b^2*c*x*Sqrt[1 - c^2*x
^2]*ArcSin[c*x]^2 + 2*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - E^((2*I
)*ArcSin[c*x])] + 2*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^((2*I)*
ArcSin[c*x])] + 2*a*b*c*x*Sqrt[1 - c^2*x^2]*Log[c*x] + a*b*c*x*Sqrt[1 - c^2
*x^2]*Log[1 - c^2*x^2] - I*b^2*c*x*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*A
rcSin[c*x])] - I*b^2*c*x*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])
])/(d*x*Sqrt[d - c^2*d*x^2])
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 805 vs. $2(346) = 692$.
time = 0.33, size = 806, normalized size = 2.42

method	result
default	$a^{2}\left(-\frac{1}{d x \sqrt{-c^{2} d \,x^{2}+d}}+\frac{2 c^{2} x}{d \sqrt{-c^{2} d \,x^{2}+d}}\right)+\frac{2 i b^{2} \sqrt{-d \left(c^{2} x^{2}-1\right)}\, \arcsin \left(c x \right)^{2} \sqrt{-c^{2} x^{2}+1}\, c}{\left(c^{2} x^{2}-1\right) d^{2}}-\frac{2 b^{2}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2/d*x/(-c^2*d*x^2+d)^(1/2))+2*I*b^2*(-
d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*c-2*b
^2*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/d^2*x*c^2+b^2*(-d*(c^2*
x^2-1))^(1/2)*arcsin(c*x)^2/(c^2*x^2-1)/d^2/x-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*
(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*arcs
in(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/(c^2*x^2-1)/d^2*c*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2
)+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*polyl
og(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))
^(1/2)/(c^2*x^2-1)/d^2*c*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+I*b^2*(-c^2*x^
2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c*polylog(2,-(I*c*x+(-c^2
*x^2+1)^(1/2))^2)+4*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^
2-1)/d^2*arcsin(c*x)*c-4*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)
/d^2*x*c^2+2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/(c^2*x^2-1)/d^2/x-2*a*b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)/d^2*ln((I*c*x+(-c^2*
x^2+1)^(1/2))^4-1)*c
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] a*b*c*(log(c*x + 1)/d^(3/2) + log(c*x - 1)/d^(3/2) + 2*log(x)/d^(3/2)) + 2*
(2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*a*b*arcsi
n(c*x) + (2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*
a^2 - b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*x^
4 - d*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}{(cx)})^2}{x^2 \left(-d (cx - 1) (cx + 1)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{x^2\,(d - c^2\,d\,x^2)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(3/2)), x)
```

3.252 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=634

$$-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\text{ArcSin}(cx))^2}{2d\sqrt{d-c^2dx^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{2dx^2\sqrt{d-c^2dx^2}}+\frac{4ibc^2\sqrt{1-c^2x^2}\,(a+b\text{Arc}}{d\sqrt{d}}$$

```
[Out] 3/2*c^2*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))^2/
d/x^2/(-c^2*d*x^2+d)^(1/2)-b*c*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d/x/(-c
^2*d*x^2+d)^(1/2)+4*I*b*c^2*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/
2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-3*c^2*(a+b*arcsin(c*x))^2*arc
tanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-b^
2*c^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
+3*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2
+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*c^2*polylog(2,-I*(I*c*x+(-c^2*x^2+
1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c^2*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-3*I
*b*c^2*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(
1/2)/d/(-c^2*d*x^2+d)^(1/2)-3*b^2*c^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*
(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+3*b^2*c^2*polylog(3,I*c*x+(-c^2*x
^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.57, antiderivative size = 634, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 14, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.483$, Rules used = {4789, 4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438, 272, 65, 214}

$$\frac{4ibc^2\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}-\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\text{ArcSin}(cx))^2}{2d\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{dx\sqrt{d-c^2dx^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{2dx^2\sqrt{d-c^2dx^2}}-\frac{3c^2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{3b^2c^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}+\frac{3b^2c^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b^2c^2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x*Sqrt[d - c^2*d*x^2])) +
(3*c^2*(a + b*ArcSin[c*x])^2)/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x
])^2/(2*d*x^2*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*c^2*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d
 - c^2*d*x^2]) - (b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d*
Sqrt[d - c^2*d*x^2]) + ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*c^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
+ ((2*I)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt
```

```
[d - c^2*d*x^2]) - ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyL
og[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*b^2*c^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (3*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
```

```
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\frac{1}{2}\left(3c^2\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin\cdots}{x^2(1-\cdots}}{d\sqrt{d-c^2dx^2}}\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\cdots$$

$$= -\frac{bc\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2\left(a+b\sin^{-1}(cx)\right)^2}{2d\sqrt{d-c^2dx^2}}-\frac{\left(a+b\sin^{-1}(cx)\right)^2}{2dx^2\sqrt{d-c^2dx^2}}+\cdots$$

Mathematica [A]

time = 7.51, size = 844, normalized size = 1.33

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-1/2*a^2/(d^2*x^2) - (a^2*c^2)/(d^2*(-1 + c^2*x^
2))) + (3*a^2*c^2*Log[x])/(2*d^(3/2)) - (3*a^2*c^2*Log[d + Sqrt[d]*Sqrt[-(d
*(-1 + c^2*x^2))]])/(2*d^(3/2)) + (a*b*c*((6*I)*PolyLog[2, -E^(I*ArcSin[c*x
])]*Sin[2*ArcSin[c*x]] - (6*I)*PolyLog[2, E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c
*x]] - (-2*ArcSin[c*x] + 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 3*ArcSin[c*x]*C
os[3*ArcSin[c*x]]*Log[1 - E^(I*ArcSin[c*x])] - 3*ArcSin[c*x]*Cos[3*ArcSin[c
*x]]*Log[1 + E^(I*ArcSin[c*x])] + 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/
2] - Sin[ArcSin[c*x]/2]] - 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*(-3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c
*x])] + 3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]
 - Sin[ArcSin[c*x]/2]] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
2*Sin[2*ArcSin[c*x]])/(c*x)))/(4*d*x*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*Sqrt
[1 - c^2*x^2]*(8*ArcSin[c*x]^2 - 4*ArcSin[c*x]*Cot[ArcSin[c*x]/2] - ArcSin[
c*x]^2*Csc[ArcSin[c*x]/2]^2 + 8*Log[Tan[ArcSin[c*x]/2]] - 16*(ArcSin[c*x]*(
Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2
, (-I)*E^(I*ArcSin[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])])) + 12*(ArcSin[
c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + (2*I)*Ar
cSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])])
+ 2*(-PolyLog[3, -E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])])) + Ar
cSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 + (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2
])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 4*ArcSin[c*x]*Tan[ArcSin[c*x
]/2]))/(8*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1489 vs. $2(641) = 1282$.
time = 0.42, size = 1490, normalized size = 2.35

method	result	size
default	Expression too large to display	1490

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(
c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-4*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2
-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-3*I*a*b*(-c
^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*dilog(1+I*c*x+(-
```

```
c^2*x^2+1)^(1/2))-3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^
2-1)/d^2*c^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-3*a*b*(-d*(c^2*x^2-1))^(1/2)/d
^2/(c^2*x^2-1)*arcsin(c*x)*c^2+a*b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/x
^2*arcsin(c*x)-1/2*a^2/d/x^2/(-c^2*d*x^2+d)^(1/2)+3/2*a^2*c^2/d/(-c^2*d*x^2
+d)^(1/2)-3/2*a^2*c^2/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a*
b*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/x*(-c^2*x^2+1)^(1/2)*c-3*I*b^2*(-c
^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)*poly
log(2,-I*c*x-(-c^2*x^2+1)^(1/2))+3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
-3/2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c^2+1/2*b^2*(
-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/x^2*arcsin(c*x)^2+b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2
))+3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*poly
log(3,-I*c*x-(-c^2*x^2+1)^(1/2))-3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/(c^2*x^2-1)/d^2*c^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2
+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*ln(I*c*x+(-c^2*x^2+1)^
(1/2)-1)+3/2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*
c^2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/2*b^2*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*
x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d
^2*c^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*arcsin(c*x)*ln(1-I*(I*c*x+(-
c^2*x^2+1)^(1/2)))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x
^2-1)/d^2*c^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*b^2*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*c^2*dilog(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2)))+b^2*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)/x*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*c
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] -1/2*(3*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2)
 - 3*c^2/(sqrt(-c^2*d*x^2 + d)*d) + 1/(sqrt(-c^2*d*x^2 + d)*d*x^2))*a^2 + s
qrt(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c
^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{x^3 (-d (cx - 1) (cx + 1))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{x^3\,(d - c^2\,d\,x^2)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(3/2)), x)
```

3.253 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=483

$$-\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3dx^2\sqrt{d-c^2dx^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\text{ArcSin}(cx))^2}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a-}{3d\sqrt{}}$$

```
[Out] -1/3*b^2*c^2*(-c^2*x^2+1)/d/x/(-c^2*d*x^2+d)^(1/2)-1/3*(a+b*arcsin(c*x))^2/
d/x^3/(-c^2*d*x^2+d)^(1/2)-4/3*c^2*(a+b*arcsin(c*x))^2/d/x/(-c^2*d*x^2+d)^(
1/2)+8/3*c^4*x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a+b*arcs
in(c*x))*(-c^2*x^2+1)^(1/2)/d/x^2/(-c^2*d*x^2+d)^(1/2)-8/3*I*c^3*(a+b*arcsi
n(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-20/3*b*c^3*(a+b*arcsin(
c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^
2+d)^(1/2)+16/3*b*c^3*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*
(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*c^3*polylog(2,-(I*c*x+(-c^2
*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-5/3*I*b^2*c^3*p
olylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^
(1/2)
```

Rubi [A]
time = 0.58, antiderivative size = 483, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4789, 4745, 4765, 3800, 2221, 2317, 2438, 4769, 4504, 4268, 270}

$$-\frac{4c^2(a+b\text{ArcSin}(cx))^2}{3dx\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3dx^2\sqrt{d-c^2dx^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\text{ArcSin}(cx))^2}{3d\sqrt{d-c^2dx^2}}-\frac{8ic^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{3d\sqrt{d-c^2dx^2}}+\frac{16bc^3\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d\sqrt{d-c^2dx^2}}-\frac{20bc^3\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d\sqrt{d-c^2dx^2}}-\frac{ib^2c^3\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{5ib^2c^3\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{3d\sqrt{d-c^2dx^2}}-\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/3*(b^2*c^2*(1 - c^2*x^2))/(d*x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(3*d*x^2*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x
])^2/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x])^2)/(3*d*x*S
qrt[d - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x])^2)/(3*d*Sqrt[d - c^2*d*x
^2]) - (((8*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d -
c^2*d*x^2]) - (20*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2
*I)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2]) + (16*b*c^3*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2
]) - (I*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d*Sq
rt[d - c^2*d*x^2]) - (((5*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*
I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
```

```
p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
```

```
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^4(d-c^2dx^2)^{3/2}}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} + \frac{1}{3}(4c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^{3/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b}{x^3}}{3d\sqrt{d-c^2dx}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\sin^{-1}(cx))^2}{3dx\sqrt{d-c^2dx^2}} +$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(}{3}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(}{3}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(}{3}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(}{3}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(}{3}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(}{3}$$

<u>Mathematica</u> [A]
time = 0.58, size = 462, normalized size = 0.96

$$\frac{-a^2-4a^2c^2x^2-b^2c^2x^2+8a^2c^4x^4+b^2c^4x^4-abcx\sqrt{1-c^2x^2}-2ab\text{ArcSin}(cx)-8abc^2x^2\text{ArcSin}(cx)+16abc^4x^4\text{ArcSin}(cx)-b^2cx\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)-b^2\text{ArcSin}(cx)^2-4b^2c^2x^2\text{ArcSin}(cx)^2+8b^2c^4x^4\text{ArcSin}(cx)^2-8ib^2c^3x^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2+10b^2c^3x^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+6b^2c^3x^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)+10abc^3x^3\sqrt{1-c^2x^2}\,\log(cx)+3abc^3x^3\sqrt{1-c^2x^2}\,\log\left(1-c^2x^2\right)-3ib^2c^3x^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)-5ib^2c^3x^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)}{3dx^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-a^2 - 4*a^2*c^2*x^2 - b^2*c^2*x^2 + 8*a^2*c^4*x^4 + b^2*c^4*x^4 - a*b*c*x
*Sqrt[1 - c^2*x^2] - 2*a*b*ArcSin[c*x] - 8*a*b*c^2*x^2*ArcSin[c*x] + 16*a*b
*c^4*x^4*ArcSin[c*x] - b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - b^2*ArcSin[c
*x]^2 - 4*b^2*c^2*x^2*ArcSin[c*x]^2 + 8*b^2*c^4*x^4*ArcSin[c*x]^2 - (8*I)*b
^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 10*b^2*c^3*x^3*Sqrt[1 - c^2*x^
2]*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 6*b^2*c^3*x^3*Sqrt[1 - c^2*
x^2]*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] + 10*a*b*c^3*x^3*Sqrt[1 - c
^2*x^2]*Log[c*x] + 3*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - (3*I)
*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (5*I)*b
```

```
^2*c^3*x^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*d*x^3*Sq
rt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2843 vs. $2(470) = 940$.
time = 0.58, size = 2844, normalized size = 5.89

method	result	size
default	Expression too large to display	2844

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)
*(-c^2*x^2+1)*c^4-40/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d
^2*x^5*c^8+7/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*c^4
+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*c^2+1/3*b^2*(
-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^3*arcsin(c*x)^2+32/3*b^
2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^7*c^10+64/3*I*b^2*(-
d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*arcsin(c*x)*(-c^2*x^2+
1)*c^8-32/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*ar
csin(c*x)*(-c^2*x^2+1)*c^6-64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c
^2*x^2-1)/d^2*x^2*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5+I*b^2*(-c^2*x^2+1)^(
1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*polylog(2,-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)-10/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x
^2-1)*c^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*arcsin(c*x)*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))^2)-10/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c
^2*x^2-1)*c^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+16/3*I*b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*arcsin(c*x)^2+10/3*I
*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*polylog(
2,-I*c*x-(-c^2*x^2+1)^(1/2))+10/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))
^(1/2)/d^2/(c^2*x^2-1)*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-32*I*b^2*(-d
*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*arcsin(c*x)*c^8+8*I*b^2
*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c*x)*c^6-8/3
*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*(-c^2*x^2+1)^
(1/2)*c^5+8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*ar
csin(c*x)*c^4-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*
arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^3+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c
^4*x^4-7*c^2*x^2-1)/d^2*x^7*arcsin(c*x)*c^10+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)
/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c-64/3*b^2*
(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c*x)^2*c^6+8*
b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)^2*c^4+
4*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)^2*c^
2-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2+1)
```

```
^(1/2)*c^3-8/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*(
-c^2*x^2+1)*c^6+32/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2
*x^5*(-c^2*x^2+1)*c^8+8/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1
)/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(
8*c^4*x^4-7*c^2*x^2-1)/d^2*x*c^4+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x
^4-7*c^2*x^2-1)/d^2*x^7*c^10-128/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*
c^2*x^2-1)/d^2*x^3*arcsin(c*x)*c^6-32*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x
^4-7*c^2*x^2-1)/d^2*x^5*c^8+8*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2
*x^2-1)/d^2*x^3*c^6+16*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d
^2*x*arcsin(c*x)*c^4+8*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d
^2/x*arcsin(c*x)*c^2+1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)
/d^2/x^2*(-c^2*x^2+1)^(1/2)*c-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)/d^2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^3-10/3*a*b*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1
/2))^2-1)*c^3+a^2*(-1/3/d/x^3/(-c^2*d*x^2+d)^(1/2)+4/3*c^2*(-1/d/x/(-c^2*d*
x^2+d)^(1/2)+2*c^2/d*x/(-c^2*d*x^2+d)^(1/2)))-128/3*I*a*b*(-d*(c^2*x^2-1))^
(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+32
/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c
*x)*c^3-8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*(-c^
2*x^2+1)*c^4-32/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*
x^3*(-c^2*x^2+1)*c^6-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2
-1)/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2
)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*(-c^2*x^2+1)*c^8+8/3*a*b*(-d*(c^2*x^2-1))
^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*c^3+2/3*a*b*(-d*(c^2*
x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^3*arcsin(c*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] 1/3*(8*c^4*x/(sqrt(-c^2*d*x^2 + d)*d) - 4*c^2/(sqrt(-c^2*d*x^2 + d)*d*x) -
1/(sqrt(-c^2*d*x^2 + d)*d*x^3))*a^2 + sqrt(d)*integrate((b^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4
), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}{(cx)})^2}{x^4 \left(-d (cx - 1) (cx + 1)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**4*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^4), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{x^4\,\left(d - c^2\,d\,x^2\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(3/2)), x)
```

3.254 $\int \frac{x^5(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=546

$$\frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}}+\frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{bx^3(a+b\text{Arc}}{3c^3d^2\sqrt{1-c^2x^2}}$$

```
[Out] 1/3*x^4*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/c^6/d^2/(-c^
2*d*x^2+d)^(1/2)+2*b^2*(-c^2*x^2+1)/c^6/d^2/(-c^2*d*x^2+d)^(1/2)-4/3*x^2*(a
+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*x^3*(a+b*arcsin(c*x))/
c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+16/3*a*b*x*(-c^2*x^2+1)^(1/
2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+16/3*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c
^5/d^2/(-c^2*d*x^2+d)^(1/2)-11/3*b*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
^5/d^2/(-c^2*d*x^2+d)^(1/2)-22/3*I*b*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x
^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^6/d^2/(-c^2*d*x^2+d)^(1/2)+11/3*I*b^2*pol
ylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^6/d^2/(-c^2*d*x^
2+d)^(1/2)-11/3*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^
(1/2)/c^6/d^2/(-c^2*d*x^2+d)^(1/2)-8/3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(
1/2)/c^6/d^3
```

Rubi [A]
time = 0.61, antiderivative size = 546, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4791, 4767, 4715, 267, 4795, 4749, 4266, 2317, 2438, 272, 45}

$$-\frac{22ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c^6d^2\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\text{ArcSin}(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{8\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{3c^6d^3}-\frac{11bx\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{4x^2(a+b\text{ArcSin}(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx^3(a+b\text{ArcSin}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}+\frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{11ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}-\frac{11ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}}+\frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] b^2/(3*c^6*d^2*Sqrt[d - c^2*d*x^2]) + (16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d
^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))/(c^6*d^2*Sqrt[d - c^2*d*x^2
]) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2
]) - (b*x^3*(a + b*ArcSin[c*x]))/(3*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]) - (11*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^5*d^2*Sqrt[d
- c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(3*c^2*d*(d - c^2*d*x^2)^(3/2))
 - (4*x^2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (8*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^3) - (((22*I)/3)*b*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c
^2*d*x^2]) + (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[
c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2]) - (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*P
olyLog[2, I*E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^5(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^4(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^4(a+b\sin^{-1}(c}{(1-c^2x^2)^2}}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^3(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4x^2(a+b\sin^{-1}(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^3(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4(a+b}{3c^2d\,(d}$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{11b^2(1-c^2x^2)}{3c^6d^2\sqrt{d-c^2dx^2}} - \frac{bx^3(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} - \frac{11b}{}$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{10b^2(1-c^2x^2)}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x}}{3c^5d^2\sqrt{d-}}$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-}}$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-}}$$

Mathematica [A]
time = 1.00, size = 594, normalized size = 1.09

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(-64*a^2 + 22*b^2 + 96*a^2*c^2*x^2 - 24*a^2*c^4*x^4 -
50*a*b*ArcSin[c*x] - 25*b^2*ArcSin[c*x]^2 + 28*b^2*Cos[2*ArcSin[c*x]] - 72*
a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 36*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]
] + 6*b^2*Cos[4*ArcSin[c*x]] - 6*a*b*ArcSin[c*x]*Cos[4*ArcSin[c*x]] - 3*b^2
*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 66*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Lo
g[1 - I*E^(I*ArcSin[c*x])] + 22*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 -
I*E^(I*ArcSin[c*x])] - 66*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*
ArcSin[c*x])] - 22*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin
[c*x])] - 66*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]
/2]] - 22*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
]] + 66*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]
```

```
+ 22*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] +
(88*I)*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (88*I)*
b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 8*a*b*Sin[2*ArcSi
n[c*x]] + 8*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 6*a*b*Sin[4*ArcSin[c*x]] +
 6*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]]))/(24*c^6*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1201 vs. $2(505) = 1010$.
time = 0.61, size = 1202, normalized size = 2.20

method	result
default	$a^2\left(-\frac{x^4}{c^2 d(-c^2 d x^2+d)^{\frac{3}{2}}}+\frac{\frac{4x^2}{c^2 d\left(-c^2 d x^2+d\right)^{\frac{3}{2}}}-\frac{8}{3 d c^4\left(-c^2 d x^2+d\right)^{\frac{3}{2}}}}{c^2}\right)-\frac{b^2\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx}{3d^3(c^2x^2-1)^2c^5}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-x^4/c^2/d/(-c^2*d*x^2+d)^(3/2)+4/c^2*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-
2/3/d/c^4/(-c^2*d*x^2+d)^(3/2)))-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^
2-1)^2/c^5*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x+11/3*b^2*(-c^2*x^2+1)^(1/2)*(-d
*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2
+1)^(1/2)))-11/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2
*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-11/3*I*b^2*(-c^2*x^2
+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2
*x^2+1)^(1/2)))+11/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^
3/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-d*(c^2*x^2-1))^
(1/2)/c^4/d^3/(c^2*x^2-1)*x^2+b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1
)*arcsin(c*x)^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^6-1/3*b^
2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^4*x^2-5/3*b^2*(-d*(c^2*x^2-1))
^(1/2)/d^3/(c^2*x^2-1)^2/c^6*arcsin(c*x)^2-2*b^2*(-d*(c^2*x^2-1))^(1/2)/c^5
/d^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x-2*b^2*(-d*(c^2*x^2-1))^(1
/2)/c^6/d^3/(c^2*x^2-1)-b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcs
in(c*x)^2*x^2+2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^4*arcsin(c*x
)^2*x^2-2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
*x-2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcsin(c*x)*x^2+2*a*b*(
-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*arcsin(c*x)+4*a*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(c^2*x^2-1)^2/c^4*arcsin(c*x)*x^2-1/3*a*b*(-d*(c^2*x^2-1))^(1/2
)/d^3/(c^2*x^2-1)^2/c^5*(-c^2*x^2+1)^(1/2)*x-10/3*a*b*(-d*(c^2*x^2-1))^(1/2
)/d^3/(c^2*x^2-1)^2/c^6*arcsin(c*x)-11/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^
2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+11/3*a*b*(-c
^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x
^2+1)^(1/2)-I)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] -1/3*a^2*(3*x^4/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 12*x^2/((-c^2*d*x^2 + d)^(
3/2)*c^4*d) + 8/((-c^2*d*x^2 + d)^(3/2)*c^6*d)) - 1/3*((3*b^2*c^4*x^4 - 12*
b^2*c^2*x^2 + 8*b^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))^2 + 3*(c^10*d^3*x^4 - 2*c^8*d^3*x^2 + c^6*d^3)*in
tegrate(2/3*(3*sqrt(c*x + 1)*sqrt(-c*x + 1)*a*b*c^5*sqrt(d)*x^5*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (3*b^2*c^6*x^6 - 15*b^2*c^4*x^4 + 20*b^2*
c^2*x^2 - 8*b^2)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^11*
d^3*x^6 - 3*c^9*d^3*x^4 + 3*c^7*d^3*x^2 - c^5*d^3), x))/(c^10*d^3*x^4 - 2*c
^8*d^3*x^2 + c^6*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^5*arcsin(c*x)^2 + 2*a*b*x^5*arcsin(c*x) + a^2*x^5)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.255 $\int \frac{x^4(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=421

$$\frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{bx^2(a+b\text{ArcSin}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\text{ArcSin}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}}-\frac{x(a+}{c^4d^2}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*x/c^4/d^2/(-
c^2*d*x^2+d)^(1/2)-x*(a+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b
*x^2*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*
b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*I*(a+b*
arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*(a+b*arc
sin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^5/d^2/(-c^2*d*x^2+d)^(1/2)-8/3*b*(a+b*ar
csin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-
c^2*d*x^2+d)^(1/2)+4/3*I*b^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2
*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.52, antiderivative size = 421, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4791, 4737, 4765, 3800, 2221, 2317, 2438, 294, 222}

$$\frac{x^3(a+b\text{ArcSin}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}}+\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc^5d^2\sqrt{d-c^2dx^2}}+\frac{4i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{8b\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{x(a+b\text{ArcSin}(cx))^2}{c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx^2(a+b\text{ArcSin}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}+\frac{4ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (b^2*x)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c^3*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*c^
2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d^2*Sqrt[d - c^
2*d*x^2]) + (((4*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^5*d^2*Sq
rt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^5*d^2
*Sqrt[d - c^2*d*x^2]) - (8*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 +
E^((2*I)*ArcSin[c*x])])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (((4*I)/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d^2*Sqrt[d - c^2*d
*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^3(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\sin^{-1}(cx)}{(1-c^2x^2)^2}}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^2(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{x(a+b\sin^{-1}(cx))^2}{c^4d^2\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - x$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

Mathematica [A]
time = 0.99, size = 374, normalized size = 0.89

$$\frac{a^2c\sqrt{d}\,x(-3+4c^2x^2)+3a^2(-1+c^2x^2)\sqrt{d-c^2dx^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right)+b^2\sqrt{d}\left(cx-c^3x^3-\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)-3cx\text{ArcSin}(cx)^2+4c^3x^3\text{ArcSin}(cx)^2+4i(1-c^2x^2)^{3/2}\,\text{ArcSin}(cx)^2+(1-c^2x^2)^{3/2}\,\text{ArcSin}(cx)^3-8(1-c^2x^2)^{3/2}\,\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)+4i(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)\right)-ab\sqrt{d}\left(\sqrt{1-c^2x^2}+(1-c^2x^2)^{3/2}\left(-3\text{ArcSin}(cx)^2+4\log\left(1-c^2x^2\right)\right)+2\text{ArcSin}(cx)\sin(3\text{ArcSin}(cx))\right)}{3c^5d^{5/2}(1-c^2x^2)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (a^2*c*Sqrt[d]*x*(-3 + 4*c^2*x^2) + 3*a^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2
]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b^2*Sqrt[d]*
(c*x - c^3*x^3 - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 3*c*x*ArcSin[c*x]^2 + 4*c^
3*x^3*ArcSin[c*x]^2 + (4*I)*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 + (1 - c^2*x^
2)^(3/2)*ArcSin[c*x]^3 - 8*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*Log[1 + E^((2*I)
*ArcSin[c*x])] + (4*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x]
)]) - a*b*Sqrt[d]*(Sqrt[1 - c^2*x^2] + (1 - c^2*x^2)^(3/2)*(-3*ArcSin[c*x]^
2 + 4*Log[1 - c^2*x^2]) + 2*ArcSin[c*x]*Sin[3*ArcSin[c*x]]))/(3*c^5*d^(5/2)
*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1303 vs. $2(393) = 786$.
time = 0.65, size = 1304, normalized size = 3.10

method	result
default	$\frac{a^2 x^3}{3c^2 d(-c^2 d\,x^2+d)^{\frac{3}{2}}} - \frac{a^2 x}{c^4 d^2 \sqrt{-c^2 d\,x^2+d}} + \frac{a^2 \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{c^4 d^2 \sqrt{c^2 d}} - \frac{b^2 \sqrt{-d\,(c^2 x^2-1)}\,\arcsin(cx)^2 x}{d^3 (c^4 x^4-2c^2 x^2+1) c^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a^2*x^3/c^2/d/(-c^2*d*x^2+d)^(3/2)-a^2/c^4/d^2*x/(-c^2*d*x^2+d)^(1/2)+a
^2/c^4/d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-b^2*(
-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^4*arcsin(c*x)^2*x-4/3*I*b
^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^5*arcsin(c*x)^2*(-c^2
*x^2+1)^(1/2)+4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2*
arcsin(c*x)^2*x^3-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1
)/c^3*(-c^2*x^2+1)^(1/2)*x^2-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*
c^2*x^2+1)/c^5*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-8/3*I*b^2*(-c^2*x^2+1)^(1/2)*
(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c*x)^2+8/3*I*a*b*(-d*(c^2
*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
*x^2-8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^5*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)+8/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c
^5/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+4/3*I*b^2
*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^3*arcsin(c*x)^2*(-c^2*x
^2+1)^(1/2)*x^2-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(
c^2*x^2-1)*arcsin(c*x)^3+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*
x^2+1)/c^4*x-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2*x
^3-a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin
(c*x)^2-16/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x
^2-1)*arcsin(c*x)+1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1
)/c^5*(-c^2*x^2+1)^(1/2)-2*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^
2+1)/c^4*arcsin(c*x)*x-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^
2+1)/c^5*(-c^2*x^2+1)^(1/2)+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
```

```
2)/c^5/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4/3*I*b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^3/(c^2*x^2-1)*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+
1)/c^2*arcsin(c*x)*x^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] 1/3*(x*(3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^
4*d)) - x/(sqrt(-c^2*d*x^2 + d)*c^4*d^2) + 3*arcsin(c*x)/(c^5*d^(5/2)))*a^2
 - sqrt(d)*integrate((b^2*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
+ 2*a*b*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(
-c*x + 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a+b\,\mathrm{asin}\,(cx))^2}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.256 $\int \frac{x^3(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=332

$$\frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx(a+b\text{ArcSin}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^2(a+b\text{ArcSin}(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2(a+b\text{ArcSin}(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{10ib\sqrt{1-}}{}$$

```
[Out] 1/3*x^2*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/c^4/d^2/(-c^
2*d*x^2+d)^(1/2)-2/3*(a+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b
*x*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-10/3*I
*b*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^
4/d^2/(-c^2*d*x^2+d)^(1/2)+5/3*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-5/3*I*b^2*polylog(2,I*(I
*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.37, antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.241$, Rules used = {4791, 4767, 4749, 4266, 2317, 2438, 267}

$$-\frac{10ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}+\frac{x^2(a+b\text{ArcSin}(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{2(a+b\text{ArcSin}(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx(a+b\text{ArcSin}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{5ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}+\frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] b^2/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c^3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(3*c^2
*d*(d - c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c
^2*d*x^2]) - (((10*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(
I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)/3)*b^2*Sqrt[1 - c^
2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) -
(((5*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d^2*
Sqrt[d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^2(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2\int \frac{x(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\sin^{-1}(cx}{(1-c^2x^2)^2}}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\sin^{-1}(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(}{3}$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(}{3}$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(}{3}$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3c^3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(}{3}$$

Mathematica [A]
time = 0.53, size = 511, normalized size = 1.54

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (8*a^2 - 2*b^2 - 12*a^2*c^2*x^2 + 4*a*b*ArcSin[c*x] + 2*b^2*ArcSin[c*x]^2 -
 2*b^2*Cos[2*ArcSin[c*x]] + 12*a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 6*b^2*A
rcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[
1 - I*E^(I*ArcSin[c*x])] - 5*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - I*E
^(I*ArcSin[c*x])] + 15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*Arc
Sin[c*x])] + 5*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x
])] + 15*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]
 + 5*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] -
15*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 5*a
*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - (20*I)
*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (20*I)*b^2*(1
 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 2*a*b*Sin[2*ArcSin[c*x]
] + 2*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(12*c^4*d^2*(-1 + c^2*x^2)*Sqrt[d
 - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 827 vs. $2(315) = 630$.
time = 0.41, size = 828, normalized size = 2.49

method	result
default	$a^2\left(\frac{x^2}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}-\frac{2}{3dc^4(-c^2dx^2+d)^{\frac{3}{2}}}\right)+\frac{b^2\sqrt{-d(c^2x^2-1)}\arcsin(cx)^2x^2}{d^3(c^2x^2-1)^2c^2}-\frac{b^2\sqrt{-d(c^2x^2-1)}\arcsin}{3d^3(c^2x^2-1}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/3/d/c^4/(-c^2*d*x^2+d)^(3/2))+b^2*(-d
*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^2*arcsin(c*x)^2*x^2-1/3*b^2*(-d*(c^
2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-1/3*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^2*x^2-2/3*b^2*(-d*(c^2*x^2-1
))^(1/2)/d^3/(c^2*x^2-1)^2/c^4*arcsin(c*x)^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)
/d^3/(c^2*x^2-1)^2/c^4+5/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^
4/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5/3*b^2*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(
1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)/c^4/d^3/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/3*I*b^
2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-1)*dilog(1-I*(
I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c
^2*arcsin(c*x)*x^2-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^3*(-c
^2*x^2+1)^(1/2)*x-4/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2/c^4*arcs
in(c*x)+5/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^3/(c^2*x^2-
1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)-5/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)/c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] 1/6*a*b*c*(2*x/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) + 5*log(c*x + 1)/(c^5*d^(5/2
)) - 5*log(c*x - 1)/(c^5*d^(5/2))) + 2/3*a*b*(3*x^2/((-c^2*d*x^2 + d)^(3/2)
*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))*arcsin(c*x) + 1/3*a^2*(3*x^2/((
-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) + b^2*inte
grate(x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*x^4 - 2*c^
2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.257 $\int \frac{x^2(a+b\textbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=332

$$\frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2(a+b\text{ArcSin}(cx))}{3cd^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\text{ArcSin}(cx))^2}{3d\,(d-c^2dx^2)^{3/2}}+\frac{i\sqrt{1-}}{}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*x/c^2/d^2/(-c^2*
d*x^2+d)^(1/2)-1/3*b*x^2*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d
*x^2+d)^(1/2)-1/3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)
^(1/2)+1/3*I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^
(1/2)-2/3*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+
1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*polylog(2,-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.26, antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4771, 4791, 4765, 3800, 2221, 2317, 2438, 294, 222}

$$-\frac{bx^2(a+b\text{ArcSin}(cx))}{3cd^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\text{ArcSin}(cx))^2}{3d\,(d-c^2dx^2)^{3/2}}+\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c^3d^2\sqrt{d-c^2dx^2}}+\frac{ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}+\frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (b^2*x)/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c*d^2*S
qrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*d*(d
 - c^2*d*x^2)^(3/2)) + ((I/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3
*d^2*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) + ((I/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d^2*Sqrt[d - c^2*d
*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
```

```
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
```

```
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx &= \frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{x^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&= -\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \cdots}{3d^2\sqrt{d-c^2d\cdots}}\\
&= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\cdots\\
&= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\cdots\\
&= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\cdots\\
&= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\cdots\\
&= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\cdots
\end{aligned}
$$

Mathematica [A]
time = 0.51, size = 303, normalized size = 0.91

$$
\frac{-b^2cx-a^2c^3x^3+b^2c^3x^3+ab\sqrt{1-c^2x^2}+ib^2\left(ic^3x^3-\sqrt{1-c^2x^2}+c^2x^2\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)^2+b\,\mathrm{ArcSin}(cx)\left(-2ac^3x^3+b\sqrt{1-c^2x^2}+2b\left(1-c^2x^2\right)^{3/2}\log\left(1+e^{2i\mathrm{ArcSin}(cx)}\right)\right)+ab\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)-abc^2x^2\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)-ib^2\left(1-c^2x^2\right)^{3/2}\mathrm{PolyLog}\left(2,-e^{2i\mathrm{ArcSin}(cx)}\right)}{3c^3d^2\left(-1+c^2x^2\right)\sqrt{d-c^2dx^2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-(b^2*c*x) - a^2*c^3*x^3 + b^2*c^3*x^3 + a*b*Sqrt[1 - c^2*x^2] + I*b^2*(I*
c^3*x^3 - Sqrt[1 - c^2*x^2] + c^2*x^2*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + b*
ArcSin[c*x]*(-2*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*(1 - c^2*x^2)^(3/2)*L
```

og[1 + E^((2*I)*ArcSin[c*x])]) + a*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - a*b*c^2*x^2*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - I*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(3*c^3*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3297 vs. 2(312) = 624.
time = 0.32, size = 3298, normalized size = 9.93

method	result	size
default	Expression too large to display	3298

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)

[Out] -2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^6-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4+8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)^2*x^3-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7+b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*x^5-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3-2*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)*x^5-a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4+a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x^2+2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*x^5+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*(-c^2*x^2+1)*x^5+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^2*(-c^2*x^2+1)*x-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*arcsin(c*x)^2*x^7-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)*x^3-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2)+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4-I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^3*(-c^2*x^2+1)^(1/2)*x^6-2/3*I*b

```
^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^3/(c^2*x^2-1)*arcsin(c*x
)^2-1/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^3/(c^2*x^2-1)
*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*arcsin(c*x)*x^7+1/3*I*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
*arcsin(c*x)*(-c^2*x^2+1)*x^3-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x
^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x^2-1/3*I*b^2*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*ar
csin(c*x)^2*(-c^2*x^2+1)^(1/2)+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*
x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)*x^5+b^2*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*x^2+2/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/
d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b^2*(-d*(c^2
*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*x^4-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9
*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)*(-c^2*x^2+1)*x^5+4/3*I*b^2
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*
arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^2-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*
c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2
)*x^4+I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^
2*x^2+1)*c^3*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^6+1/3*I*a*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3+2
*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1
)*c^4*arcsin(c*x)*x^7-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6
*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*
c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3+a^2*(1/2*x/c^2/d/(-c^2*d*x^2+
d)^(3/2)-1/2/c^2*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/
2)))-b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x
^2+1)*c^2*arcsin(c*x)^2*x^5+1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8
-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2)-1/3*I*b^2*(-d*(c^
2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x
)*x^3-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-
5*c^2*x^2+1)*c^2*(-c^2*x^2+1)*x^5-4/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2
-1))^(1/2)/c^3/d^3/(c^2*x^2-1)*arcsin(c*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] 1/3*a*b*c*(1/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) - log(c*x + 1)/(c^4*d^(5/2)) -
 log(c*x - 1)/(c^4*d^(5/2))) - 2/3*a*b*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) -
```

```
x/((-c^2*d*x^2 + d)^(3/2)*c^2*d))*arcsin(c*x) - 1/3*a^2*(x/(sqrt(-c^2*d*x^2
 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + b^2*integrate(x^2*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^
2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral(x**2*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,(a+b\operatorname{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.258 $\int \frac{x(a+b\textbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=294

$$\frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx(a+b\text{ArcSin}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}}+\frac{2ib\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{Ar}}{3c^2d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/c^2/d^2/(-c^2*d*
x^2+d)^(1/2)-1/3*b*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2
+d)^(1/2)+2/3*I*b*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*
x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*I*b^2*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2
*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d
*x^2+d)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 294, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4767, 4747, 4749, 4266, 2317, 2438, 267}

$$\frac{2ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx(a+b\text{ArcSin}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}}-\frac{ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] b^2/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^2*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*c^2*d*(d -
c^2*d*x^2)^(3/2)) + (((2*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcT
an[E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2]) - ((I/3)*b^2*Sqrt[1 -
c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2])
+ ((I/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d^2*Sq
rt[d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx(a+b\sin^{-1}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{}{(1-c}}{3d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{(b}{}$$

$$= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{2ib}{}$$

$$= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{2ib}{}$$

$$= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\sin^{-1}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{2ib}{}$$

Mathematica [**A**]
time = 0.61, size = 461, normalized size = 1.57

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (a^2*Sqrt[-(d*(-1 + c^2*x^2))])/(3*c^2*d^3*(-1 + c^2*x^2)^2) + (a*b*(8*ArcS
in[c*x] + 3*Sqrt[1 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]
 - Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[3*ArcSin[c*x]]*(Log[
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]]) - 2*Sin[2*ArcSin[c*x]]))/(12*c^2*d*(d*(1 - c^2*x^2))^(3/2)) +
 (b^2*(2 + 4*ArcSin[c*x]^2 + 2*Cos[2*ArcSin[c*x]] - 3*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[
1 - I*E^(I*ArcSin[c*x])] + 3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*A
rcSin[c*x])] + ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])]
- (4*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*(1 -
 c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*ArcSin[c*x]*Sin[2*ArcSi
n[c*x]]))/(12*c^2*d*(d*(1 - c^2*x^2))^(3/2))
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 761 vs. 2(281) = 562.
time = 0.20, size = 762, normalized size = 2.59

method	result
default	$\frac{a^2}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}}-\frac{b^2\sqrt{-d\,(c^2x^2-1)}\,\arcsin(cx)\sqrt{-c^2x^2+1}\,x}{3d^3(c^4x^4-2c^2x^2+1)c}-\frac{b^2\sqrt{-d\,(c^2x^2-1)}\,x^2}{3d^3(c^4x^4-2c^2x^2+1)}+\frac{b^2\sqrt{-d\,(c^2x}{3d^3(c^4x}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*
x^4-2*c^2*x^2+1)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-1/3*b^2*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c
^4*x^4-2*c^2*x^2+1)/c^2*arcsin(c*x)^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c
^4*x^4-2*c^2*x^2+1)/c^2-1/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c
^2/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/3*b^2*(
-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^3/(c^2*x^2-1)*arcsin(c*x)*ln
(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-
1))^(1/2)/c^2/d^3/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/3*I*b
^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^3/(c^2*x^2-1)*dilog(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c
^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^
4-2*c^2*x^2+1)/c^2*arcsin(c*x)-1/3*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+1/3*a*b*(-c^2*x^2+
1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(
1/2)+I)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -sqrt(d)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*
a*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x) + 1/3*a^2/((-c^
2*d*x^2 + d)^(3/2)*c^2*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
 a^2*x)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.259 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=311

$$\frac{b^2x}{3d^2\sqrt{d-c^2dx^2}}-\frac{b(a+b\text{ArcSin}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x(a+b\text{ArcSin}(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{2x(a+b\text{ArcSin}(cx))^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{2i\sqrt{1-c^2x^2}}{3cd^2}$$

```
[Out] 1/3*x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*x/d^2/(-c^2*d*x^2+
d)^(1/2)+2/3*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*(a+b*arcs
in(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2/3*I*(a+b*arcsin(c*
x))^2*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*b*(a+b*arcsin(c*x))
*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)
^(1/2)-2/3*I*b^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2
)/c/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 311, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.346, Rules used = {4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197}

$$-\frac{b(a+b\text{ArcSin}(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2x(a+b\text{ArcSin}(cx))^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{2i\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))^2}{3cd^2\sqrt{d-c^2dx^2}}+\frac{4b\sqrt{1-c^2x^2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3cd^2\sqrt{d-c^2dx^2}}+\frac{x(a+b\text{ArcSin}(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}+\frac{b^2x}{3d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (b^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*(a + b*ArcSin[c*x]))/(3*c*d^2*Sqrt
[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^
2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) -
 (((2*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c*d^2*Sqrt[d - c^2*d*
x^2]) + (4*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[
c*x])])/(3*c*d^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*Sqrt[1 - c^2*x^2]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3d} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x\left(a+b\sin^{-1}(cx)\right)^2}{3d^2\sqrt{d-c^2dx^2}} + \cdots$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+\cdots}{3d^2\sqrt{\cdots}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+\cdots}{3d^2\sqrt{\cdots}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+\cdots}{3d^2\sqrt{\cdots}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+\cdots}{3d^2\sqrt{\cdots}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b\left(a+b\sin^{-1}(cx)\right)}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+\cdots}{3d^2\sqrt{\cdots}}$$

Mathematica [A]
time = 0.58, size = 320, normalized size = 1.03

$$\frac{-3a^2cx-b^2cx+2a^2c^3x^3+b^2c^3x^3+ab\sqrt{1-c^2x^2}+b^2\left(-3cx+2c^3x^3+2i\sqrt{1-c^2x^2}-2ic^2x^2\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)^2+b\text{ArcSin}(cx)\left(-6acx+4ac^3x^3+b\sqrt{1-c^2x^2}-4b(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)\right)-2ab\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)+2abc^2x^2\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)+2ib^2(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)}{3cd^2\left(-1+c^2x^2\right)\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-3*a^2*c*x - b^2*c*x + 2*a^2*c^3*x^3 + b^2*c^3*x^3 + a*b*Sqrt[1 - c^2*x^2]
 + b^2*(-3*c*x + 2*c^3*x^3 + (2*I)*Sqrt[1 - c^2*x^2] - (2*I)*c^2*x^2*Sqrt[1
 - c^2*x^2])*ArcSin[c*x]^2 + b*ArcSin[c*x]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt
[1 - c^2*x^2] - 4*b*(1 - c^2*x^2)^(3/2)*Log[1 + E^((2*I)*ArcSin[c*x])]) - 2
```

```
*a*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] + 2*a*b*c^2*x^2*Sqrt[1 - c^2*x^2]*L
og[1 - c^2*x^2] + (2*I)*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin
[c*x])])/(3*c*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2894 vs. 2(293) = 586.
time = 0.17, size = 2895, normalized size = 9.31

method	result	size
default	Expression too large to display	2895

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c
*(-c^2*x^2+1)^(1/2)+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*
x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*(-c^2*x^2+1)*x^5-2*I*b^2*(-d*(c^2*x^2-1))
^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*arcsin(c*x)^2*(-c^2*x^2+
1)^(1/2)*x^4-10/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11
*c^2*x^2-4)*c^2*arcsin(c*x)*(-c^2*x^2+1)*x^3+14/3*I*b^2*(-d*(c^2*x^2-1))^(1
/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)^2*(-c^2*x^2+1)^(1
/2)*x^2-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2
-4)*c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4+28/3*I*a*b*(-d*(c^2*x^2-1))^(1/2
)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*
x^2-2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^
4*arcsin(c*x)^2*x^5+17/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x
^4+11*c^2*x^2-4)*c^2*arcsin(c*x)^2*x^3+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(
3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^5+4/3*b^2*(-d*(c^2*x^
2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)-4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x
^2-4)*c^2*(-c^2*x^2+1)*x^3-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10
*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x+13/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3
*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x-4*b^2*(-d*(c^2*x^2-1))
^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)^2*x+2/3*b^2*(-d*
(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7-3*b^2*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5-2*I*a*
b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x+4/3*a*b*
(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+
1)^(1/2)-8*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*arcsin(c*x)*x+4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4
+11*c^2*x^2-4)*c^6*x^7-4*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x
^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^5+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*
c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x-a*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2+34/3*a*b*(
```

```
-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*
x)*x^3+16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x
^2-4)*c^2*x^3-14/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+1
1*c^2*x^2-4)*c^4*x^5-4/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^
3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*b^2*(-d*(c^2*x^2-1))^(1/
2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x+a^2*(1/3*x/d/(-c^2*d*x^2+d)^(3
/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(
3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-10/3*I*
a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^
2*x^2+1)*x^3+4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*
c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^5+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6
*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*arcsin(c*x)*x^7-I*b^2*(-d*(c^2*x^2-1))^(1
/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*(-c^2*x^2+1)^(1/2)*x^4-8/3*
I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcs
in(c*x)^2*(-c^2*x^2+1)^(1/2)-4/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1
/2)/c/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b^2*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*x^2+2/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/
c/d^3/(c^2*x^2-1)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*I*b^2*(-d*(c^2
*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*(-c^2*x^
2+1)*x-14/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x
^2-4)*c^4*arcsin(c*x)*x^5+16/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-
10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/
2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2+4/3*I*b
^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^3/(c^2*x^2-1)*arcsin(c*x)^
2+8/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^3/(c^2*x^2-1)*arc
sin(c*x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*b*c*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2))
 + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2)
+ x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*(2*x/(sqrt(-c^2*d*x^2
 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + b^2*integrate(arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{(-d(cx - 1)(cx + 1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\operatorname{asin}(c\,x))^2}{(d - c^2\,d\,x^2)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(5/2), x)
```

3.260 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=577

$$\frac{b^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bcx(a+b\text{ArcSin}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{(a+b\text{ArcSin}(cx))^2}{d^2\sqrt{d-c^2dx^2}}+\frac{14ib\sqrt{1-c^2x^2}\,(a$$

```
[Out] 1/3*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/d^2/(-c^2*d*x^2+d)^(
1/2)+(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*x*(a+b*arcsin(c*x
))/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+14/3*I*b*(a+b*arcsin(c*x))*a
rctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/d^2/(-c^2*d*x^2+d)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-7/3*I*b^2*polylog(2
,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
+7/3*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(
-c^2*d*x^2+d)^(1/2)-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c
^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)+2*b^2*polylog(
3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.52, antiderivative size = 577, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438, 4747, 267}

$$\frac{14ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2\sqrt{d-c^2dx^2}}-\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2\sqrt{d-c^2dx^2}}-\frac{bcx(a+b\text{ArcSin}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{d^2\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{d^2\sqrt{d-c^2dx^2}}+\frac{(a+b\text{ArcSin}(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{7ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}+\frac{7ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{b^2}{3d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] b^2/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1
 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*d*(d - c^2*d*x^
2)^(3/2)) + (a + b*ArcSin[c*x])^2/(d^2*Sqrt[d - c^2*d*x^2]) + (((14*I)/3)*b
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d^2*Sqrt
[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*
ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) -
(((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d^2*S
qrt[d - c^2*d*x^2]) + (((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (2*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x
```

```
^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d
- c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx = \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx}{d} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(a+b\sin^{-1}(cx))^2}{d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{(a+}{x\sqrt{}}}{}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(a+b\sin}{d^2\sqrt{d-}}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(a+b\sin}{d^2\sqrt{d-}}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(a+b\sin}{d^2\sqrt{d-}}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(a+b\sin}{d^2\sqrt{d-}}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(a+b\sin}{d^2\sqrt{d-}}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(a+b\sin}{d^2\sqrt{d-}}$$

Mathematica [A]
time = 7.58, size = 935, normalized size = 1.62

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(a^2/(3*d^3*(-1 + c^2*x^2)^2) - a^2/(d^3*(-1 + c^
2*x^2))) + (a^2*Log[c*x])/d^(5/2) - (a^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2
*x^2))]]])/d^(5/2) + (b^2*(1 - c^2*x^2)^(3/2)*(4 - ((-2 + ArcSin[c*x])*ArcSi
n[c*x])/(-1 + c*x) + 14*ArcSin[c*x]^2 + 12*ArcSin[c*x]^2*(Log[1 - E^(I*ArcS
in[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) - 28*(ArcSin[c*x]*(Log[1 - I*E^(I*A
rcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcS
in[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])])) + (24*I)*ArcSin[c*x]*(PolyLog
[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) + 24*(-PolyLog[3,
```

```
-E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])]) + (2*ArcSin[c*x]^2*Sin
[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (2*(2 + 7*Ar
cSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])
- (2*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2])^3 + (ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2])^2 - (2*(2 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/
2] + Sin[ArcSin[c*x]/2])))/(12*d*(d*(1 - c^2*x^2))^(3/2)) + (a*b*(20*ArcSin
[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x
]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - E^(
I*ArcSin[c*x])] - 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x]
)] - 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*ArcSin[c*x])] + 21*Sqrt[
1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 7*Cos[3*ArcSin[
c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 21*Sqrt[1 - c^2*x^2]*L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 7*Cos[3*ArcSin[c*x]]*Log[Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2
, -E^(I*ArcSin[c*x])] - (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, E^(I*ArcSin[c
*x])] - 2*Sin[2*ArcSin[c*x]]))/(12*d*(d*(1 - c^2*x^2))^(3/2))
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1372 vs. 2(580) = 1160.
time = 0.33, size = 1373, normalized size = 2.38

method	result	size
default	Expression too large to display	1373

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)+1/3*b^2*(-d*(c
^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*
x^2-1)^2*x^2*c^2+2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x
^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-2*a*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)*x^2*c^2-1/3*a*b*(-d*(c^
2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)*x*c+2*a*b*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2))-14/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2
*x^2-1)*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*a*b*(
-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(I*c*x+(-c^2*
x^2+1)^(1/2))+4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)^
2+1/3*a^2/d/(-c^2*d*x^2+d)^(3/2)+a^2/d^2/(-c^2*d*x^2+d)^(1/2)-a^2/d^(5/2)*l
n((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^
3/(c^2*x^2-1)^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x*c-2*I*b^2*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*polylog(2,-I*c*x-(-c^
```

```
2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*
x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-d*(c^2*x^2-1))
^(1/2)/d^3/(c^2*x^2-1)^2*arcsin(c*x)^2*x^2*c^2+b^2*(-c^2*x^2+1)^(1/2)*(-d*(
c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/
2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*
x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-7/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2
-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7
/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x
)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*
x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-7/3*I*b
^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*dilog(1-I*(I*c
*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*a^2*(3*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(5/2)
 - 3/(sqrt(-c^2*d*x^2 + d)*d^2) - 1/((-c^2*d*x^2 + d)^(3/2)*d)) - sqrt(d)*i
ntegrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x
^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\text{could not integrate}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x\,(d-c^2\,d\,x^2)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(5/2)), x)
```

3.261 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=452

$$\frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc(a+b\text{ArcSin}(cx))}{3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{dx\,(d-c^2dx^2)^{3/2}}+\frac{4c^2x(a+b\text{ArcSin}(cx))^2}{3d\,(d-c^2dx^2)^{3/2}}+\frac{8c^2x(a+b\text{A}}{3d^2\sqrt{d-}}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/x/(-c^2*d*x^2+d)^(3/2)+4/3*c^2*x*(a+b*arcsin(c*x))^2
/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*c^2*x/d^2/(-c^2*d*x^2+d)^(1/2)+8/3*c^2*x*(a
+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a+b*arcsin(c*x))/d^2/(-
c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-8/3*I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2
+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-4*b*c*(a+b*arcsin(c*x))*arctanh((I*c*x+(
-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)+16/3*b*c*
(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2
/(-c^2*d*x^2+d)^(1/2)-5/3*I*b^2*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*
(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*
x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]

time = 0.43, antiderivative size = 452, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 14, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.483$, Rules used = {4789, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4793, 4769, 4504, 4268}

$$-\frac{bc(a+b\text{ArcSin}(cx))}{3d^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}+\frac{8c^2x(a+b\text{ArcSin}(cx))^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{8ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{3d^2\sqrt{d-c^2dx^2}}+\frac{16bc\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{4bc\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2\sqrt{d-c^2dx^2}}+\frac{4c^2x(a+b\text{ArcSin}(cx))^2}{3d\,(d-c^2dx^2)^{3/2}}-\frac{(a+b\text{ArcSin}(cx))^2}{dx\,(d-c^2dx^2)^{3/2}}-\frac{5ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (b^2*c^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(d*x*(d - c^
2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2
)) + (8*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/
3)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (
4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) + (16*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*
Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((5*I)/3)*b^
2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2
*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d
^2*Sqrt[d - c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
```

```
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + (4c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}}{x(1-c^2}}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{bc(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+b\sin^{-1}(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(8c^2)}{}$$

$$= -\frac{b^2c^2x}{d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+}{3d(d-}$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+b}{3d(d-}$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+b}{3d(d-}$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+b}{3d(d-}$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+b}{3d(d-}$$

$$= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+b}{3d(d-}$$

Mathematica [A]
time = 1.80, size = 352, normalized size = 0.78

$$-\frac{c\left(\frac{a^2(3-12c^2x^2+8c^4x^4)}{cx}+\frac{2ab(3-12c^2x^2+8c^4x^4)\text{ArcSin}(cx)}{cx}+ab\sqrt{1-c^2x^2}\left(1+6(-1+c^2x^2)\log(cx)+5(-1+c^2x^2)\log(1-c^2x^2)\right)-b^2(1-c^2x^2)^{3/2}\left(\frac{cx}{\sqrt{1-c^2x^2}}+\frac{\text{ArcSin}(cx)}{-1+c^2x^2}-8i\text{ArcSin}(cx)^2+\frac{cx\text{ArcSin}(cx)^2}{(1-c^2x^2)^{3/2}}+\frac{5cx\text{ArcSin}(cx)^2}{\sqrt{1-c^2x^2}}-\frac{3\sqrt{1-c^2x^2}\text{ArcSin}(cx)^2}{cx}+6\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+10\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right)-5i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right)-3i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)\right)}{3d(d-c^2dx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/3*(c*((a^2*(3 - 12*c^2*x^2 + 8*c^4*x^4))/(c*x) + (2*a*b*(3 - 12*c^2*x^2
+ 8*c^4*x^4)*ArcSin[c*x])/(c*x) + a*b*Sqrt[1 - c^2*x^2]*(1 + 6*(-1 + c^2*x^
2)*Log[c*x] + 5*(-1 + c^2*x^2)*Log[1 - c^2*x^2]) - b^2*(1 - c^2*x^2)^(3/2)*
((c*x)/Sqrt[1 - c^2*x^2] + ArcSin[c*x]/(-1 + c^2*x^2) - (8*I)*ArcSin[c*x]^2
 + (c*x*ArcSin[c*x]^2)/(1 - c^2*x^2)^(3/2) + (5*c*x*ArcSin[c*x]^2)/Sqrt[1 -
 c^2*x^2] - (3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c*x) + 6*ArcSin[c*x]*Log[1
 - E^((2*I)*ArcSin[c*x])] + 10*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] -
 (5*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (3*I)*PolyLog[2, E^((2*I)*ArcSi
n[c*x])])))/(d*(d - c^2*d*x^2)^(3/2))
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3772 vs. 2(443) = 886.
time = 0.39, size = 3773, normalized size = 8.35

method	result	size
default	Expression too large to display	3773

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 40*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3
*(-c^2*x^2+1)*c^4-64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+2
6*c^2*x^2-9)/d^3*x^4*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*c^5+136/3*I*b^2*(-d*(
c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*arcsin(c*x)^2
*(-c^2*x^2+1)^(1/2)*c^3+40*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x
^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)*(-c^2*x^2+1)*c^4+64/3*I*b^2*(-d*(c^2*x
^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*arcsin(c*x)*(-c^2*
x^2+1)*c^8+32/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^
2-1)*arcsin(c*x)*c-8*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*
c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2-8/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6
-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3-2*b^2*
(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2))-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)
/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-10/3*b^2*(-c^
2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25
*c^4*x^4+26*c^2*x^2-9)/d^3*x^9*arcsin(c*x)*c^10-224/3*I*b^2*(-d*(c^2*x^2-1)
)^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*arcsin(c*x)*c^8+280/3*I
*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arc
sin(c*x)*c^6-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*
x^2-9)/d^3*x^4*(-c^2*x^2+1)^(1/2)*c^5-48*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^
6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)*c^4+17/3*I*b^2*(-d*(c^2*
x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2
)*c^3+8*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3*x*arcsin(c*x)*c^2+16/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^
```

```
3/(c^2*x^2-1)*c*arcsin(c*x)^2+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)/d^3/(c^2*x^2-1)*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*polylog(2,I*c*x+(-c^2*
x^2+1)^(1/2))+5/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*
x^2-1)*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-24*I*b^2*(-d*(c^2*x^2-1))
^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*arcsin(c*x)^2*(-c^2*x^2+1)^(
1/2)*c+18*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3/x*arcsin(c*x)+3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x
^2-9)/d^3*(-c^2*x^2+1)^(1/2)*c+3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c
^4*x^4+26*c^2*x^2-9)/d^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c+a^2*(-1/d/x/(-c^2
*d*x^2+d)^(3/2)+4*c^2*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d
)^(1/2)))-64/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-
9)/d^3*x^5*arcsin(c*x)^2*c^6+56*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^
4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)^2*c^4-44*b^2*(-d*(c^2*x^2-1))^(1/2)
/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)^2*c^2+32/3*b^2*(-d*(
c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*(-c^2*x^2+1)*
c^8-88/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3
*x^5*(-c^2*x^2+1)*c^6+80/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4
+26*c^2*x^2-9)/d^3*x^3*(-c^2*x^2+1)*c^4-8*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6
*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2-3*I*b^2*(-d*(c^2*x^2-1
))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*c+5*b^2
*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*c^2+9*b^2
*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3/x*arcsin(c*
x)^2+32/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3*x^9*c^10-40*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9
)/d^3*x^7*c^8+160/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2
*x^2-9)/d^3*x^5*c^6-29*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*
c^2*x^2-9)/d^3*x^3*c^4-128/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4
*x^4+26*c^2*x^2-9)/d^3*x^4*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+272/3*I*a*b*(
-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*c^3-160/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*
c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)*(-c^2*x^2+1)*c^6-8*I*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)*(-c^2*
x^2+1)*c^2-224/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*
x^2-9)/d^3*x^7*c^8-48*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26
*c^2*x^2-9)/d^3*x^3*c^4+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4
*x^4+26*c^2*x^2-9)/d^3*x^9*c^10-128/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6
-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)*c^6-10/3*a*b*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2
)*c+280/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/
d^3*x^5*c^6+8*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2
-9)/d^3*x*c^2-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^...
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] 1/3*a^2*(8*c^2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 4*c^2*x/((-c^2*d*x^2 + d)^(3/
2)*d) - 3/((-c^2*d*x^2 + d)^(3/2)*d*x)) - sqrt(d)*integrate((b^2*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c
^2*d^3*x^4 - d^3*x^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{x^2 \left(-d(cx-1)(cx+1)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^2\,(d-c^2\,d\,x^2)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(5/2)), x)
```

3.262 $\int \frac{(a+b\textbf{ArcSin}(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=752

$$\frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc(a+b\text{ArcSin}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{2bc^3x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2(a+b\text{ArcSin}(cx))^2}{6d(d-c^2dx^2)^{3/2}}-\frac{(a+}{2dx^2}$$

```
[Out] 5/6*c^2*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)-1/2*(a+b*arcsin(c*x))^2/
d/x^2/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*c^2/d^2/(-c^2*d*x^2+d)^(1/2)+5/2*c^2*(a+
b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-b*c*(a+b*arcsin(c*x))/d^2/x/(-c^2
*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2/3*b*c^3*x*(a+b*arcsin(c*x))/d^2/(-c^2*
x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+26/3*I*b*c^2*(a+b*arcsin(c*x))*arctan(I*c
*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5*c^2*(a
+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/
(-c^2*d*x^2+d)^(1/2)-b^2*c^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/d^2/(-c^2*d*x^2+d)^(1/2)+5*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^
2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-13/3*I*b^2*c^2*
polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2
+d)^(1/2)+13/3*I*b^2*c^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+
1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,I*c
*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5*b^2*c^
2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d
)^(1/2)+5*b^2*c^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^
2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]

time = 0.79, antiderivative size = 752, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 17, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.586$, Rules used = {4789, 4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438, 4747, 267, 272, 53, 65, 214}

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (b^2*c^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (2*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d
^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x])^2)/(
6*d*(d - c^2*d*x^2)^(3/2)) - (a + b*ArcSin[c*x])^2/(2*d*x^2*(d - c^2*d*x^2)
^(3/2)) + (5*c^2*(a + b*ArcSin[c*x])^2)/(2*d^2*Sqrt[d - c^2*d*x^2]) + (((26
*I)/3)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])
])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
```

```
^2*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (b^2*c^2*Sqrt[1
- c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d^2*Sqrt[d - c^2*d*x^2]) + ((5*I)*b
*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/
(d^2*Sqrt[d - c^2*d*x^2]) - (((13*I)/3)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2
, (-I)*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (((13*I)/3)*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]
) - ((5*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcS
in[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog
[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (5*b^2*c^2*Sqrt[1 - c^
2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
```

```
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{2dx^2(d-c^2dx^2)^{3/2}} + \frac{1}{2}(5c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{a+}{x^2}}{d^2\sqrt{d-c^2dx}}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\sin^{-1}(cx))^2}{6d(d-c^2dx^2)^{3/2}} - \frac{(a+b\sin^{-1}(cx))^2}{2dx^2(d-c^2dx^2)^{3/2}} + \cdots$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\sin^{-1}(c}{6d(d-c^2dx^2)}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} +$$

Mathematica [A]
time = 9.13, size = 1090, normalized size = 1.45

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-1/2*a^2/(d^3*x^2) + (a^2*c^2)/(3*d^3*(-1 + c^2*
x^2)^2) - (2*a^2*c^2)/(d^3*(-1 + c^2*x^2))) + (5*a^2*c^2*Log[x])/(2*d^(5/2)
) - (5*a^2*c^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/(2*d^(5/2)) + (a
*b*c^2*Sqrt[1 - c^2*x^2]*((-2*(-1 + ArcSin[c*x]))/(-1 + c*x) + 52*ArcSin[c*
```

```
x] - 6*Cot[ArcSin[c*x]/2] - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 60*ArcSin[
c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + 52*Log[Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]] + (60*I)*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*Arc
Sin[c*x])]) + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + (4*ArcSin[c*x]*Sin[ArcSi
n[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (52*ArcSin[c*x]*Si
n[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x
]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*(1 +
 ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (52*ArcSin[c*x
]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*Tan[Arc
Sin[c*x]/2]))/(12*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*Sqrt[1 - c^2*x^2]*(
8 - (2*(-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) + 52*ArcSin[c*x]^2 - 12*A
rcSin[c*x]*Cot[ArcSin[c*x]/2] - 3*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 + 24*L
og[Tan[ArcSin[c*x]/2]] - 104*(ArcSin[c*x]*(Log[1 - I*E^(I*ArcSin[c*x])] - L
og[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - Poly
Log[2, I*E^(I*ArcSin[c*x])])) + 60*(ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x]
)] - Log[1 + E^(I*ArcSin[c*x])]) + (2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcS
in[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) + 2*(-PolyLog[3, -E^(I*ArcSin[c*
x])] + PolyLog[3, E^(I*ArcSin[c*x])])) + 3*ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]
^2 + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[
c*x]/2])^3 + (4*(2 + 13*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]
/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (4*(2 + 13*ArcSin[c*x]^2)*Sin[ArcS
in[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 12*ArcSin[c*x]*Tan[
ArcSin[c*x]/2]))/(24*d^2*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1875 vs. 2(739) = 1478.
time = 0.46, size = 1876, normalized size = 2.49

method	result	size
default	Expression too large to display	1876

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -5/2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*arcsin(c*x)^2
*c^4+b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))-b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^
2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+5*b^2*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/
2))-5*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*pol
ylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+5*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)*c^2/d^3/(c^2*x^2-1)*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
```

```
-5*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*arcs
in(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(c^4*x^4-2*c^2*x^2+1)*x*(-c^2*x^2+1)^(1/2)*c^3-a*b*(-d*(c^2*x^2-1))^(1
/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x*(-c^2*x^2+1)^(1/2)*c-5*a*b*(-d*(c^2*x^2-1))
^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*arcsin(c*x)*c^4+5/6*a^2*c^2/d/(-c^2*d*
x^2+d)^(3/2)+5/2*a^2*c^2/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*a^2*c^2/d^(5/2)*ln((2
*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-1/2*a^2/d/x^2/(-c^2*d*x^2+d)^(3/2)+1/
3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*c^2-1/3*b^2*(-d*(c^2
*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x^2*c^4+10/3*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*arcsin(c*x)^2*c^2-1/2*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x^2*arcsin(c*x)^2+2/3*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)*x*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3-b^2*(-
d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x*(-c^2*x^2+1)^(1/2)*arcsin(
c*x)*c+5/2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1
)*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-5/2*b^2*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^
2+1)^(1/2))+13/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c
^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-13/3*b^2*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2
*x^2+1)^(1/2)))+13/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/
(c^2*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-13/3*I*b^2*(-c^2
*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*dilog(1-I*(I*c*x+(
-c^2*x^2+1)^(1/2)))+20/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+
1)*arcsin(c*x)*c^2-a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^4*x^4-2*c^2*x^2+1)/x^2
*arcsin(c*x)+5*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x
^2-1)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-26/3*I*a*b*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*arctan(I*c*x+(-c^2*x^2+1)^(1
/2))-5*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^2/d^3/(c^2*x^2-1)*
dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-5*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)*c^2/d^3/(c^2*x^2-1)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] -1/6*a^2*(15*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^
(5/2) - 15*c^2/(sqrt(-c^2*d*x^2 + d)*d^2) - 5*c^2/((-c^2*d*x^2 + d)^(3/2)*d
) + 3/((-c^2*d*x^2 + d)^(3/2)*d*x^2)) - sqrt(d)*integrate((b^2*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2
*d^3*x^5 - d^3*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}{(cx)})^2}{x^3 \left(-d (cx - 1) (cx + 1)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**3*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\, x))^2}{x^3 \left(d - c^2\, d\, x^2\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(5/2)), x)
```

3.263 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^4(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=538

$$-\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}}+\frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}}-\frac{bc(a+b\text{ArcSin}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}-\frac{(a+b\text{ArcSin}(cx))^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2(a+b\text{ArcS}}{dx\left(d-c^2d\right.}$$

```
[Out] -1/3*(a+b*arcsin(c*x))^2/d/x^3/(-c^2*d*x^2+d)^(3/2)-2*c^2*(a+b*arcsin(c*x))
^2/d/x/(-c^2*d*x^2+d)^(3/2)+8/3*c^4*x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^
(3/2)-1/3*b^2*c^2/d^2/x/(-c^2*d*x^2+d)^(1/2)+2/3*b^2*c^4*x/d^2/(-c^2*d*x^2+
d)^(1/2)+16/3*c^4*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a
+b*arcsin(c*x))/d^2/x^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-16/3*I*c^3*
(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-32/3*b*c^3*
(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/
d^2/(-c^2*d*x^2+d)^(1/2)+32/3*b*c^3*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2
+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-8/3*I*b^2*c^3*pol
ylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)
^(1/2)-8/3*I*b^2*c^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(
1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A]
time = 0.72, antiderivative size = 538, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 15, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.517$, Rules used = {4789, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4793, 4769, 4504, 4268, 277}

$$-\frac{bc(a+b\text{ArcSin}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\,\sqrt{d-c^2dx^2}}-\frac{2c^2(a+b\text{ArcSin}(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}}-\frac{(a+b\text{ArcSin}(cx))^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}}+\frac{16c^4x(a+b\text{ArcSin}(cx))^2}{3d^2\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\text{ArcSin}(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{16ic^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{3d^2\sqrt{d-c^2dx^2}}+\frac{32bc^3\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{32bc^3\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}}+\frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/3*(b^2*c^2)/(d^2*x*Sqrt[d - c^2*d*x^2]) + (2*b^2*c^4*x)/(3*d^2*Sqrt[d -
c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d
 - c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(3*d*x^3*(d - c^2*d*x^2)^(3/2)) - (2
*c^2*(a + b*ArcSin[c*x])^2)/(d*x*(d - c^2*d*x^2)^(3/2)) + (8*c^4*x*(a + b*A
rcSin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x*(a + b*ArcSin[c*x])^
2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((16*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (32*b*c^3*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2])
 + (32*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[
c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*
PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*
b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d -
c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^4(d-c^2dx^2)^{5/2}}\,dx = -\frac{(a+b\sin^{-1}(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} + (2c^2)\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b}{x^3(}}{3d^2\sqrt{d-c^2dx}}$$

$$= -\frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\sin^{-1}(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} - \frac{2c^2(a+b\sin^{-1}(cx))^2}{dx(d-c^2dx^2)^{3/2}}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{8bc^3(a+b\sin^{-1}(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2d}}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} - \frac{2b^2c^4x}{d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+}{3dx^3(}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+}{3dx^3}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+}{3dx^3}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+}{3dx^3}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+}{3dx^3}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\sin^{-1}(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+}{3dx^3}$$

Mathematica [A]
time = 2.49, size = 441, normalized size = 0.82

$$\frac{-\frac{a^2(1+6c^2x^2-24c^4x^4+16c^6x^6)}{x^3} - \frac{ab\left(2(1+6c^2x^2-24c^4x^4+16c^6x^6)\text{ArcSin}(cx)+cx\sqrt{1-c^2x^2}\,(1+16c^2x^2(-1+c^2x^2)\log(cx)+8c^2x^2(-1+c^2x^2)\log(1-c^2x^2))\right)}{x^3} + b^2c^3(1-c^2x^2)^{3/2}\left(\frac{cx}{\sqrt{1-c^2x^2}} - \frac{\sqrt{1-c^2x^2}}{cx} - \frac{\text{ArcSin}(cx)}{c^2x^2} + \frac{\text{ArcSin}(cx)}{-1+c^2x^2} - 16i\text{ArcSin}(cx)^2 + \frac{cx\text{ArcSin}(cx)^2}{(1-c^2x^2)^{3/2}} + \frac{8cx\text{ArcSin}(cx)^2}{\sqrt{1-c^2x^2}} - \frac{\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2}{c^3x^3} - \frac{8\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2}{cx} + 16\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right) + 16\text{ArcSin}(cx)\log\left(1+e^{2i\text{ArcSin}(cx)}\right) - 8i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(cx)}\right) - 8i\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)}{3d(d-c^2dx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (-((a^2*(1 + 6*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x^6))/x^3) - (a*b*(2*(1 + 6*c^
2*x^2 - 24*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x] + c*x*Sqrt[1 - c^2*x^2]*(1 + 1
6*c^2*x^2*(-1 + c^2*x^2)*Log[c*x] + 8*c^2*x^2*(-1 + c^2*x^2)*Log[1 - c^2*x^
2])))/x^3 + b^2*c^3*(1 - c^2*x^2)^(3/2)*((c*x)/Sqrt[1 - c^2*x^2] - Sqrt[1 -
 c^2*x^2]/(c*x) - ArcSin[c*x]/(c^2*x^2) + ArcSin[c*x]/(-1 + c^2*x^2) - (16*
I)*ArcSin[c*x]^2 + (c*x*ArcSin[c*x]^2)/(1 - c^2*x^2)^(3/2) + (8*c*x*ArcSin[
```

```
c*x]^2)/Sqrt[1 - c^2*x^2] - (Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c^3*x^3) - (
8*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c*x) + 16*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] + 16*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - (8*I)*PolyL
og[2, -E^((2*I)*ArcSin[c*x])] - (8*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(
3*d*(d - c^2*d*x^2)^(3/2))
```

Maple [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5224 vs. $2(517) = 1034$.
time = 0.61, size = 5225, normalized size = 9.71

method	result	size
default	Expression too large to display	5225

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] 1/3*a*b*c*(8*c^2*log(c*x + 1)/d^(5/2) + 8*c^2*log(c*x - 1)/d^(5/2) + 16*c^2
*log(x)/d^(5/2) + 1/(c^2*d^(5/2)*x^4 - d^(5/2)*x^2)) + 2/3*(16*c^4*x/(sqrt(
-c^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d) - 6*c^2/((-c^2*d*
x^2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*a*b*arcsin(c*x) + 1
/3*(16*c^4*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d
) - 6*c^2/((-c^2*d*x^2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*
a^2 + b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*
x^8 - 2*c^2*d^2*x^6 + d^2*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^10 - 3*c^4*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{asin}\,(cx))^2}{x^4\,(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**4*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^4), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^4\,(d-c^2\,d\,x^2)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(5/2)), x)
```

3.264 $\int \frac{x^4 \textbf{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}} \, dx$

Optimal. Leaf size=157

$$\frac{15x\sqrt{1-a^2x^2}}{64a^4}+\frac{x^3\sqrt{1-a^2x^2}}{32a^2}-\frac{15\text{ArcSin}(ax)}{64a^5}+\frac{3x^2\text{ArcSin}(ax)}{8a^3}+\frac{x^4\text{ArcSin}(ax)}{8a}-\frac{3x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{8a^4}$$

```
[Out] -15/64*arcsin(a*x)/a^5+3/8*x^2*arcsin(a*x)/a^3+1/8*x^4*arcsin(a*x)/a+1/8*ar
csin(a*x)^3/a^5+15/64*x*(-a^2*x^2+1)^(1/2)/a^4+1/32*x^3*(-a^2*x^2+1)^(1/2)/
a^2-3/8*x*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^4-1/4*x^3*arcsin(a*x)^2*(-a^2*
x^2+1)^(1/2)/a^2
```

Rubi [A]

time = 0.19, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4795, 4737, 4723, 327, 222}

$$\frac{\text{ArcSin}(ax)^3}{8a^5}-\frac{15\text{ArcSin}(ax)}{64a^5}+\frac{3x^2\text{ArcSin}(ax)}{8a^3}-\frac{x^3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{4a^2}+\frac{x^3\sqrt{1-a^2x^2}}{32a^2}-\frac{3x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{8a^4}+\frac{15x\sqrt{1-a^2x^2}}{64a^4}+\frac{x^4\text{ArcSin}(ax)}{8a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (15*x*Sqrt[1 - a^2*x^2])/(64*a^4) + (x^3*Sqrt[1 - a^2*x^2])/(32*a^2) - (15*
ArcSin[a*x])/(64*a^5) + (3*x^2*ArcSin[a*x])/(8*a^3) + (x^4*ArcSin[a*x])/(8*
a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2)/(4*a^2) + ArcSin[a*x]^3/(8*a^5)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
```

```
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^4\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{4a^2}+\frac{3\int \frac{x^2\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{4a^2}+\frac{\int x^3\sin^{-1}(ax)\,dx}{2a}$$

$$= \frac{x^4\sin^{-1}(ax)}{8a}-\frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{8a^4}-\frac{x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{4a^2}-\frac{1}{8}\int \frac{x^4}{\sqrt{1-a}}$$

$$= \frac{x^3\sqrt{1-a^2x^2}}{32a^2}+\frac{3x^2\sin^{-1}(ax)}{8a^3}+\frac{x^4\sin^{-1}(ax)}{8a}-\frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{8a^4}-\frac{x^3\sqrt{1}}{}$$

$$= \frac{15x\sqrt{1-a^2x^2}}{64a^4}+\frac{x^3\sqrt{1-a^2x^2}}{32a^2}+\frac{3x^2\sin^{-1}(ax)}{8a^3}+\frac{x^4\sin^{-1}(ax)}{8a}-\frac{3x\sqrt{1-a^2x^2}\,\mathrm{si}}{8a^4}$$

$$= \frac{15x\sqrt{1-a^2x^2}}{64a^4}+\frac{x^3\sqrt{1-a^2x^2}}{32a^2}-\frac{15\sin^{-1}(ax)}{64a^5}+\frac{3x^2\sin^{-1}(ax)}{8a^3}+\frac{x^4\sin^{-1}(ax)}{8a}-$$

Mathematica [A]
time = 0.04, size = 100, normalized size = 0.64

$$\frac{ax\sqrt{1-a^2x^2}\,(15+2a^2x^2)+(-15+24a^2x^2+8a^4x^4)\,\mathrm{ArcSin}(ax)-8ax\sqrt{1-a^2x^2}\,(3+2a^2x^2)\,\mathrm{ArcSin}(ax)^2+8\mathrm{ArcSin}(ax)^3}{64a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a*x*Sqrt[1 - a^2*x^2]*(15 + 2*a^2*x^2) + (-15 + 24*a^2*x^2 + 8*a^4*x^4)*Ar
cSin[a*x] - 8*a*x*Sqrt[1 - a^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x]^2 + 8*ArcSi
n[a*x]^3)/(64*a^5)
```

Maple [A]
time = 0.14, size = 129, normalized size = 0.82

method	result
default	$\frac{-16\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^3x^3+8a^4x^4\arcsin(ax)+2a^3x^3\sqrt{-a^2x^2+1}-24\arcsin(ax)^2\sqrt{-a^2x^2+1}\,ax+24a^2x^2\text{ ar}}{64a^5}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/64*(-16*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^3*x^3+8*a^4*x^4*arcsin(a*x)+2*
a^3*x^3*(-a^2*x^2+1)^(1/2)-24*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a*x+24*a^2*x
^2*arcsin(a*x)+8*arcsin(a*x)^3+15*a*x*(-a^2*x^2+1)^(1/2)-15*arcsin(a*x))/a^
5
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A]
time = 1.68, size = 84, normalized size = 0.54

$$\frac{8\arcsin(ax)^3+(8a^4x^4+24a^2x^2-15)\arcsin(ax)+\left(2a^3x^3-8(2a^3x^3+3ax)\arcsin(ax)^2+15ax\right)\sqrt{-a^2x^2+1}}{64a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/64*(8*arcsin(a*x)^3 + (8*a^4*x^4 + 24*a^2*x^2 - 15)*arcsin(a*x) + (2*a^3*
x^3 - 8*(2*a^3*x^3 + 3*a*x)*arcsin(a*x)^2 + 15*a*x)*sqrt(-a^2*x^2 + 1))/a^5
```

Sympy [A]
time = 0.64, size = 146, normalized size = 0.93

$$\begin{cases}\frac{x^4\operatorname{asin}(ax)}{8a}-\frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{4a^2}+\frac{x^3\sqrt{-a^2x^2+1}}{32a^2}+\frac{3x^2\operatorname{asin}(ax)}{8a^3}-\frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{8a^4}+\frac{15x\sqrt{-a^2x^2+1}}{64a^4}+\frac{\operatorname{asin}^3(ax)}{8a^5}-\frac{15\operatorname{asin}(ax)}{64a^5} & \text{for } a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**4*asin(a*x)/(8*a) - x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(4
*a**2) + x**3*sqrt(-a**2*x**2 + 1)/(32*a**2) + 3*x**2*asin(a*x)/(8*a**3) -
3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(8*a**4) + 15*x*sqrt(-a**2*x**2 + 1)/
(64*a**4) + asin(a*x)**3/(8*a**5) - 15*asin(a*x)/(64*a**5), Ne(a, 0)), (0,
True))
```

Giac [A]
time = 0.43, size = 143, normalized size = 0.91

$$\frac{(-a^2x^2+1)^{\frac{3}{2}}x\arcsin(ax)^2}{4a^4}-\frac{5\sqrt{-a^2x^2+1}\,x\arcsin(ax)^2}{8a^4}-\frac{(-a^2x^2+1)^{\frac{3}{2}}x}{32a^4}+\frac{(a^2x^2-1)^2\arcsin(ax)}{8a^5}+\frac{\arcsin(ax)^3}{8a^5}+\frac{17\sqrt{-a^2x^2+1}\,x}{64a^4}+\frac{5(a^2x^2-1)\arcsin(ax)}{8a^5}+\frac{17\arcsin(ax)}{64a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)^2/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arc
sin(a*x)^2/a^4 - 1/32*(-a^2*x^2 + 1)^(3/2)*x/a^4 + 1/8*(a^2*x^2 - 1)^2*arcs
in(a*x)/a^5 + 1/8*arcsin(a*x)^3/a^5 + 17/64*sqrt(-a^2*x^2 + 1)*x/a^4 + 5/8*
(a^2*x^2 - 1)*arcsin(a*x)/a^5 + 17/64*arcsin(a*x)/a^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4\,\mathrm{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^4*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.265 $\int \frac{x^3 \text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=126

$$\frac{14\sqrt{1-a^2x^2}}{9a^4}-\frac{2(1-a^2x^2)^{3/2}}{27a^4}+\frac{4x\text{ArcSin}(ax)}{3a^3}+\frac{2x^3\text{ArcSin}(ax)}{9a}-\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\,\text{A}}{3a^2}$$

```
[Out] -2/27*(-a^2*x^2+1)^(3/2)/a^4+4/3*x*arcsin(a*x)/a^3+2/9*x^3*arcsin(a*x)/a+14
/9*(-a^2*x^2+1)^(1/2)/a^4-2/3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^4-1/3*x^2*
arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A]
time = 0.14, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {4795, 4767, 4715, 267, 4723, 272, 45}

$$\frac{4x\text{ArcSin}(ax)}{3a^3}-\frac{x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{3a^2}-\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{3a^4}-\frac{2(1-a^2x^2)^{3/2}}{27a^4}+\frac{14\sqrt{1-a^2x^2}}{9a^4}+\frac{2x^3\text{ArcSin}(ax)}{9a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (14*Sqrt[1 - a^2*x^2])/(9*a^4) - (2*(1 - a^2*x^2)^(3/2))/(27*a^4) + (4*x*Ar
cSin[a*x])/(3*a^3) + (2*x^3*ArcSin[a*x])/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSi
n[a*x]^2)/(3*a^4) - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(3*a^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^3 \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{3a^2} + \frac{2\int \frac{x\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{3a^2} + \frac{2\int x^2\sin^{-1}(ax)\,dx}{3a}$$

$$= \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{3a^2} - \frac{2}{9}\int \frac{x^3}{\sqrt{1-a^2}}$$

$$= \frac{4x\sin^{-1}(ax)}{3a^3} + \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{3a^2}$$

$$= \frac{4\sqrt{1-a^2x^2}}{3a^4} + \frac{4x\sin^{-1}(ax)}{3a^3} + \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{3a^4} - \frac{x^2\sqrt{1-a}}{}$$

$$= \frac{14\sqrt{1-a^2x^2}}{9a^4} - \frac{2(1-a^2x^2)^{3/2}}{27a^4} + \frac{4x\sin^{-1}(ax)}{3a^3} + \frac{2x^3\sin^{-1}(ax)}{9a} - \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}}{3a^4}$$

Mathematica [A]
time = 0.03, size = 81, normalized size = 0.64

$$\frac{2\sqrt{1-a^2x^2}\,(20+a^2x^2)+6ax(6+a^2x^2)\,\mathrm{ArcSin}(ax)-9\sqrt{1-a^2x^2}\,(2+a^2x^2)\,\mathrm{ArcSin}(ax)^2}{27a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2]*(20 + a^2*x^2) + 6*a*x*(6 + a^2*x^2)*ArcSin[a*x] - 9*S
qrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin[a*x]^2)/(27*a^4)
```

Maple [A]
time = 0.10, size = 127, normalized size = 1.01

method	result
default	$-\frac{\left(9a^4x^4\arcsin(ax)^2+9\arcsin(ax)^2a^2x^2+6\arcsin(ax)\sqrt{-a^2x^2+1}\,a^3x^3-2a^4x^4-38a^2x^2-18\arcsin(ax)^2+36ax\arcsin(ax)\sqrt{}\right.}{27a^4(a^2x^2-1)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/27/a^4*(9*a^4*x^4*arcsin(a*x)^2+9*arcsin(a*x)^2*a^2*x^2+6*arcsin(a*x)*(-
a^2*x^2+1)^(1/2)*a^3*x^3-2*a^4*x^4-38*a^2*x^2-18*arcsin(a*x)^2+36*a*x*arcsi
n(a*x)*(-a^2*x^2+1)^(1/2)+40)*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)
```

Maxima [A]
time = 0.48, size = 105, normalized size = 0.83

$$-\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}\,x^2}{a^2}+\frac{2\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin(ax)^2+\frac{2\left(\sqrt{-a^2x^2+1}\,x^2+\frac{20\sqrt{-a^2x^2+1}}{a^2}\right)}{27\,a^2}+\frac{2\,(a^2x^3+6\,x)\arcsin(ax)}{9\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x^2 + 1)/a^4)*arcsin(a*x)^2
+ 2/27*(sqrt(-a^2*x^2 + 1)*x^2 + 20*sqrt(-a^2*x^2 + 1)/a^2)/a^2 + 2/9*(a^2*
x^3 + 6*x)*arcsin(a*x)/a^3
```

Fricas [A]
time = 4.03, size = 64, normalized size = 0.51

$$\frac{6\left(a^{3}x^{3}+6\,ax\right)\arcsin\left(ax\right)+\left(2\,a^{2}x^{2}-9\left(a^{2}x^{2}+2\right)\arcsin\left(ax\right)^{2}+40\right)\sqrt{-a^{2}x^{2}+1}}{27\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/27*(6*(a^3*x^3 + 6*a*x)*arcsin(a*x) + (2*a^2*x^2 - 9*(a^2*x^2 + 2)*arcsin
(a*x)^2 + 40)*sqrt(-a^2*x^2 + 1))/a^4
```

Sympy [A]
time = 0.47, size = 121, normalized size = 0.96

$$\begin{cases} \frac{2x^{3}\operatorname{asin}\left(ax\right)}{9a}-\frac{x^{2}\sqrt{-a^{2}x^{2}+1}\operatorname{asin}^{2}\left(ax\right)}{3a^{2}}+\frac{2x^{2}\sqrt{-a^{2}x^{2}+1}}{27a^{2}}+\frac{4x\operatorname{asin}\left(ax\right)}{3a^{3}}-\frac{2\sqrt{-a^{2}x^{2}+1}\operatorname{asin}^{2}\left(ax\right)}{3a^{4}}+\frac{40\sqrt{-a^{2}x^{2}+1}}{27a^{4}} & \text{for}\ a\neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((2*x**3*asin(a*x)/(9*a) - x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/
(3*a**2) + 2*x**2*sqrt(-a**2*x**2 + 1)/(27*a**2) + 4*x*asin(a*x)/(3*a**3) -
 2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(3*a**4) + 40*sqrt(-a**2*x**2 + 1)/(27
*a**4), Ne(a, 0)), (0, True))
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3 \operatorname{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^3*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.266 $\int \frac{x^2 \text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}} dx$

Optimal. Leaf size=89

$$\frac{x\sqrt{1-a^2x^2}}{4a^2} - \frac{\text{ArcSin}(ax)}{4a^3} + \frac{x^2\text{ArcSin}(ax)}{2a} - \frac{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{2a^2} + \frac{\text{ArcSin}(ax)^3}{6a^3}$$

```
[Out] -1/4*arcsin(a*x)/a^3+1/2*x^2*arcsin(a*x)/a+1/6*arcsin(a*x)^3/a^3+1/4*x*(-a^
2*x^2+1)^(1/2)/a^2-1/2*x*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A]
time = 0.10, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4795, 4737, 4723, 327, 222}

$$\frac{\text{ArcSin}(ax)^3}{6a^3} - \frac{\text{ArcSin}(ax)}{4a^3} - \frac{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{2a^2} + \frac{x\sqrt{1-a^2x^2}}{4a^2} + \frac{x^2\text{ArcSin}(ax)}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x*Sqrt[1 - a^2*x^2])/(4*a^2) - ArcSin[a*x]/(4*a^3) + (x^2*ArcSin[a*x])/(2*
a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*a^2) + ArcSin[a*x]^3/(6*a^3)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2 \sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx &= -\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2a^2}+\frac{\int \frac{\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{2a^2}+\frac{\int x\sin^{-1}(ax)\,dx}{a}\\
&= \frac{x^2\sin^{-1}(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2a^2}+\frac{\sin^{-1}(ax)^3}{6a^3}-\frac{1}{2}\int \frac{x^2}{\sqrt{1-a^2x^2}}\,dx\\
&= \frac{x\sqrt{1-a^2x^2}}{4a^2}+\frac{x^2\sin^{-1}(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2a^2}+\frac{\sin^{-1}(ax)^3}{6a^3}-\frac{\int \frac{1}{\sqrt{1-a^2x^2}}}{4a^2}\\
&= \frac{x\sqrt{1-a^2x^2}}{4a^2}-\frac{\sin^{-1}(ax)}{4a^3}+\frac{x^2\sin^{-1}(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2a^2}+\frac{\sin^{-1}(ax)^3}{6a^3}
\end{aligned}
$$

Mathematica [A]
time = 0.02, size = 73, normalized size = 0.82

$$\frac{3ax\sqrt{1-a^2x^2}+(-3+6a^2x^2)\,\mathrm{ArcSin}(ax)-6ax\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^2+2\mathrm{ArcSin}(ax)^3}{12a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (3*a*x*Sqrt[1 - a^2*x^2] + (-3 + 6*a^2*x^2)*ArcSin[a*x] - 6*a*x*Sqrt[1 - a^
2*x^2]*ArcSin[a*x]^2 + 2*ArcSin[a*x]^3)/(12*a^3)
```

Maple [A]
time = 0.12, size = 71, normalized size = 0.80

method	result	size
default	$\frac{-6\arcsin(ax)^2\sqrt{-a^2x^2+1}\,ax+6a^2x^2\arcsin(ax)+2\arcsin(ax)^3+3ax\sqrt{-a^2x^2+1}-3\arcsin(ax)}{12a^3}$	71

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/12*(-6*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a*x+6*a^2*x^2*arcsin(a*x)+2*arcsin(a*x)^3+3*a*x*(-a^2*x^2+1)^(1/2)-3*arcsin(a*x))/a^3

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(x^2*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)

Fricas [A]
time = 2.24, size = 59, normalized size = 0.66

$$\frac{2\arcsin(ax)^3+3(2a^2x^2-1)\arcsin(ax)-3\sqrt{-a^2x^2+1}\left(2ax\arcsin(ax)^2-ax\right)}{12a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] 1/12*(2*arcsin(a*x)^3 + 3*(2*a^2*x^2 - 1)*arcsin(a*x) - 3*sqrt(-a^2*x^2 + 1)*(2*a*x*arcsin(a*x)^2 - a*x))/a^3

Sympy [A]
time = 0.36, size = 78, normalized size = 0.88

$$\begin{cases} \frac{x^2\operatorname{asin}(ax)}{2a}-\frac{x\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{2a^2}+\frac{x\sqrt{-a^2x^2+1}}{4a^2}+\frac{\operatorname{asin}^3(ax)}{6a^3}-\frac{\operatorname{asin}(ax)}{4a^3} & \text{for } a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**2*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)

[Out] Piecewise((x**2*asin(a*x)/(2*a) - x*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(2*a**2) + x*sqrt(-a**2*x**2 + 1)/(4*a**2) + asin(a*x)**3/(6*a**3) - asin(a*x)/(4*a**3), Ne(a, 0)), (0, True))

Giac [A]
time = 0.45, size = 81, normalized size = 0.91

$$-\frac{\sqrt{-a^2x^2+1}\,x\arcsin\left(ax\right)^2}{2\,a^2}+\frac{\arcsin\left(ax\right)^3}{6\,a^3}+\frac{\sqrt{-a^2x^2+1}\,x}{4\,a^2}+\frac{\left(a^2x^2-1\right)\arcsin\left(ax\right)}{2\,a^3}+\frac{\arcsin\left(ax\right)}{4\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^2/a^2 + 1/6*arcsin(a*x)^3/a^3 + 1/4*s
qrt(-a^2*x^2 + 1)*x/a^2 + 1/2*(a^2*x^2 - 1)*arcsin(a*x)/a^3 + 1/4*arcsin(a*
x)/a^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^2*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.267 $\int \frac{x\mathbf{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=55

$$\frac{2\sqrt{1-a^2x^2}}{a^2}+\frac{2x\text{ArcSin}(ax)}{a}-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{a^2}$$

```
[Out] 2*x*arcsin(a*x)/a+2*(-a^2*x^2+1)^(1/2)/a^2-arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)
/a^2
```

Rubi [A]
time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4767, 4715, 267}

$$-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{a^2}+\frac{2\sqrt{1-a^2x^2}}{a^2}+\frac{2x\text{ArcSin}(ax)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2])/a^2 + (2*x*ArcSin[a*x])/a - (Sqrt[1 - a^2*x^2]*ArcSin
[a*x]^2)/a^2
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{a^2} + \frac{2\int \sin^{-1}(ax)\,dx}{a}$$
$$= \frac{2x\sin^{-1}(ax)}{a} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{a^2} - 2\int \frac{x}{\sqrt{1-a^2x^2}}\,dx$$
$$= \frac{2\sqrt{1-a^2x^2}}{a^2} + \frac{2x\sin^{-1}(ax)}{a} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{a^2}$$

Mathematica [A]
time = 0.01, size = 51, normalized size = 0.93

$$\frac{2\sqrt{1-a^2x^2}+2ax\text{ArcSin}(ax)-\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2] + 2*a*x*ArcSin[a*x] - Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)
/a^2
```

Maple [A]
time = 0.10, size = 80, normalized size = 1.45

method	result	size
default	$-\frac{\sqrt{-a^2x^2+1}\,\left(\arcsin(ax)^2a^2x^2-\arcsin(ax)^2+2ax\arcsin(ax)\sqrt{-a^2x^2+1}-2a^2x^2+2\right)}{a^2(a^2x^2-1)}$	80

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(arcsin(a*x)^2*a^2*x^2-arcsin(a*x)^2+
2*a*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)-2*a^2*x^2+2)
```

Maxima [A]
time = 0.48, size = 49, normalized size = 0.89

$$-\frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)^2}{a^2}+\frac{2\left(ax\arcsin(ax)+\sqrt{-a^2x^2+1}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/a^2 + 2*(a*x*arcsin(a*x) + sqrt(-a^2*x^2
+ 1))/a^2
```

Fricas [A]
time = 3.50, size = 35, normalized size = 0.64

$$\frac{2\,ax\arcsin\left(ax\right)-\sqrt{-a^2x^2+1}\,\left(\arcsin\left(ax\right)^2-2\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (2*a*x*arcsin(a*x) - sqrt(-a^2*x^2 + 1)*(arcsin(a*x)^2 - 2))/a^2
```

Sympy [A]
time = 0.27, size = 49, normalized size = 0.89

$$\begin{cases} \frac{2x\operatorname{asin}\left(ax\right)}{a}-\frac{\sqrt{-a^2x^2+1}\operatorname{asin}^2\left(ax\right)}{a^2}+\frac{2\sqrt{-a^2x^2+1}}{a^2} & \text{for}\: a\neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((2*x*asin(a*x)/a - sqrt(-a**2*x**2 + 1)*asin(a*x)**2/a**2 + 2*sqr
t(-a**2*x**2 + 1)/a**2, Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.45, size = 49, normalized size = 0.89

$$-\frac{\sqrt{-a^2x^2+1}\,\arcsin\left(ax\right)^2}{a^2}+\frac{2\left(ax\arcsin\left(ax\right)+\sqrt{-a^2x^2+1}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/a^2 + 2*(a*x*arcsin(a*x) + sqrt(-a^2*x^2
+ 1))/a^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,\mathrm{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.268 $\int \frac{\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=13

$$\frac{\text{ArcSin}(ax)^3}{3a}$$

```
[Out] 1/3*arcsin(a*x)^3/a
```

Rubi [A]
time = 0.02, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {4737}

$$\frac{\text{ArcSin}(ax)^3}{3a}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^3/(3*a)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\sin^{-1}(ax)^3}{3a}$$

Mathematica [A]
time = 0.00, size = 13, normalized size = 1.00

$$\frac{\text{ArcSin}(ax)^3}{3a}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^3/(3*a)
```

Maple [A]
time = 0.08, size = 12, normalized size = 0.92

method	result	size
derivativedivides	$\frac{\arcsin(ax)^3}{3a}$	12
default	$\frac{\arcsin(ax)^3}{3a}$	12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/3*arcsin(a*x)^3/a
```

Maxima [A]
time = 0.48, size = 11, normalized size = 0.85

$$\frac{\arcsin{(ax)}^3}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/3*arcsin(a*x)^3/a
```

Fricas [A]
time = 1.80, size = 11, normalized size = 0.85

$$\frac{\arcsin{(ax)}^3}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/3*arcsin(a*x)^3/a
```

Sympy [A]
time = 0.22, size = 10, normalized size = 0.77

$$\begin{cases} \frac{\operatorname{asin}^{3}{(ax)}}{3a} & \text{for}\: a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((asin(a*x)**3/(3*a), Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.43, size = 11, normalized size = 0.85

$$\frac{\arcsin(ax)^3}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/3*arcsin(a*x)^3/a
```

Mupad [B]
time = 0.15, size = 11, normalized size = 0.85

$$\frac{\mathrm{asin}(a\,x)^3}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] asin(a*x)^3/(3*a)
```

3.269 $\int \frac{\text{ArcSin}(ax)^2}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=92

$$-2\text{ArcSin}(ax)^2\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)+2i\text{ArcSin}(ax)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right)-2i\text{ArcSin}(ax)\text{PolyLog}\left(2,e^{i\text{ArcS}}\right.$$

```
[Out] -2*arcsin(a*x)^2*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+2*I*arcsin(a*x)*polylog(
2,-I*a*x-(-a^2*x^2+1)^(1/2))-2*I*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+1)^(
1/2))-2*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+2*polylog(3,I*a*x+(-a^2*x^2+1)
^(1/2))
```

Rubi [A]
time = 0.10, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4803, 4268, 2611, 2320, 6724}

$$2i\text{ArcSin}(ax)\text{Li}_2\left(-e^{i\text{ArcSin}(ax)}\right)-2i\text{ArcSin}(ax)\text{Li}_2\left(e^{i\text{ArcSin}(ax)}\right)-2\text{Li}_3\left(-e^{i\text{ArcSin}(ax)}\right)+2\text{Li}_3\left(e^{i\text{ArcSin}(ax)}\right)-2\text{ArcSin}(ax)^2\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] + (2*I)*ArcSin[a*x]*PolyLog[2,
-E^(I*ArcSin[a*x])] - (2*I)*ArcSin[a*x]*PolyLog[2, E^(I*ArcSin[a*x])] - 2*P
olyLog[3, -E^(I*ArcSin[a*x])] + 2*PolyLog[3, E^(I*ArcSin[a*x])]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{x\sqrt{1-a^2x^2}}\,dx = \text{Subst}\left(\int x^2\csc(x)\,dx, x, \sin^{-1}(ax)\right)$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - 2\text{Subst}\left(\int x\log\left(1-e^{ix}\right)\,dx, x, \sin^{-1}(ax)\right) + 2\text{S}$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 2i\sin^{-1}(ax)\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 2i\sin^{-1}(ax)\text{Li}_2\Big(e$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 2i\sin^{-1}(ax)\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 2i\sin^{-1}(ax)\text{Li}_2\Big(e$$
$$= -2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 2i\sin^{-1}(ax)\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 2i\sin^{-1}(ax)\text{Li}_2\Big(e$$

Mathematica [A]
time = 0.07, size = 116, normalized size = 1.26

$$\text{ArcSin}(ax)^2\log\left(1-e^{i\text{ArcSin}(ax)}\right) - \text{ArcSin}(ax)^2\log\left(1+e^{i\text{ArcSin}(ax)}\right) + 2i\text{ArcSin}(ax)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right) - 2i\text{ArcSin}(ax)\text{PolyLog}\left(2,e^{i\text{ArcSin}(ax)}\right) - 2\text{PolyLog}\left(3,-e^{i\text{ArcSin}(ax)}\right) + 2\text{PolyLog}\left(3,e^{i\text{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] ArcSin[a*x]^2*Log[1 - E^(I*ArcSin[a*x])] - ArcSin[a*x]^2*Log[1 + E^(I*ArcSi
n[a*x])] + (2*I)*ArcSin[a*x]*PolyLog[2, -E^(I*ArcSin[a*x])] - (2*I)*ArcSin[
a*x]*PolyLog[2, E^(I*ArcSin[a*x])] - 2*PolyLog[3, -E^(I*ArcSin[a*x])] + 2*P
olyLog[3, E^(I*ArcSin[a*x])]
```

Maple [A]
time = 0.14, size = 161, normalized size = 1.75

method	result
default	$-\arcsin(ax)^2 \ln\left(1+iax+\sqrt{-a^2x^2+1}\right)+2i\arcsin(ax)\,\mathrm{polylog}\left(2,-iax-\sqrt{-a^2x^2+1}\right)-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -arcsin(a*x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+2*I*arcsin(a*x)*polylog(2,-I*
a*x-(-a^2*x^2+1)^(1/2))-2*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+arcsin(a*x)^
2*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-2*I*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+
1)^(1/2))+2*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^3 - x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{asin}^2(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**2/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{asin}(a\,x)^2}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(x*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^2/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.270 $\int \frac{\text{ArcSin}(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=76

$$-ia\text{ArcSin}(ax)^2-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{x}+2a\text{ArcSin}(ax)\log\left(1-e^{2i\text{ArcSin}(ax)}\right)-ia\text{PolyLog}\left(2,e^{2i\text{ArcSin}(ax)}\right)$$

```
[Out] -I*a*arcsin(a*x)^2+2*a*arcsin(a*x)*ln(1-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-I*a*p
olylog(2,(I*a*x+(-a^2*x^2+1)^(1/2))^2)-arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/x
```

Rubi [A]
time = 0.11, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4771, 4721, 3798, 2221, 2317, 2438}

$$-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{x}-ia\text{Li}_2\left(e^{2i\text{ArcSin}(ax)}\right)-ia\text{ArcSin}(ax)^2+2a\text{ArcSin}(ax)\log\left(1-e^{2i\text{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-I)*a*ArcSin[a*x]^2 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/x + 2*a*ArcSin[a*x
]*Log[1 - E^((2*I)*ArcSin[a*x])] - I*a*PolyLog[2, E^((2*I)*ArcSin[a*x])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
```

```
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sin^{-1}(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{x}+(2a)\int \frac{\sin^{-1}(ax)}{x}\,dx\\
&= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{x}+(2a)\text{Subst}\left(\int x\cot(x)\,dx,x,\sin^{-1}(ax)\right)\\
&= -ia\sin^{-1}(ax)^2-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{x}-(4ia)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx,x,\sin^{-1}(ax)\right)\\
&= -ia\sin^{-1}(ax)^2-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{x}+2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right)-(2a)\text{S}\\
&= -ia\sin^{-1}(ax)^2-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{x}+2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right)+(ia)\text{S}\\
&= -ia\sin^{-1}(ax)^2-\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{x}+2a\sin^{-1}(ax)\log\left(1-e^{2i\sin^{-1}(ax)}\right)-ia\text{Li}_2
\end{aligned}$$

Mathematica [A]
time = 0.18, size = 72, normalized size = 0.95

$$\text{ArcSin}(ax)\left(-\frac{\left(iax+\sqrt{1-a^2x^2}\right)\text{ArcSin}(ax)}{x}+2a\log\left(1-e^{2i\text{ArcSin}(ax)}\right)\right)-ia\text{PolyLog}\left(2,e^{2i\text{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(x^2*Sqrt[1 - a^2*x^2]),x]
```

[Out] ArcSin[a*x]*(-(((I*a*x + Sqrt[1 - a^2*x^2])*ArcSin[a*x])/x) + 2*a*Log[1 - E^((2*I)*ArcSin[a*x])]) - I*a*PolyLog[2, E^((2*I)*ArcSin[a*x])]

Maple [A]
time = 0.20, size = 141, normalized size = 1.86

method	result
default	$\frac{\left(iax-\sqrt{-a^2x^2+1}\right)\arcsin(ax)^2}{x}-2ia\left(i\arcsin\left(ax\right)\ln\left(1+iax+\sqrt{-a^2x^2+1}\right)+i\arcsin\left(ax\right)\ln\left(\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] (I*a*x-(-a^2*x^2+1)^(1/2))*arcsin(a*x)^2/x-2*I*a*(I*arcsin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+I*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))+arcsin(a*x)^2+polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))+polylog(2,I*a*x+(-a^2*x^2+1)^(1/2)))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] -(sqrt(a*x + 1)*sqrt(-a*x + 1)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^2 - 2*a*x*integrate(arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))/x, x))/x

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^4 - x^2), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\operatorname{asin}^2\left(ax\right)}{x^2\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/x**2/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)**2/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{asin}(a\,x)^2}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(x^2*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^2/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.271 $\int \frac{\text{ArcSin}(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=163

$$-\frac{a\text{ArcSin}(ax)}{x}-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{2x^2}-a^2\text{ArcSin}(ax)^2\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)-a^2\tanh^{-1}\left(\sqrt{1-a^2x^2}\right)+ia$$

```
[Out] -a*arcsin(a*x)/x-a^2*arcsin(a*x)^2*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))-a^2*ar
ctanh((-a^2*x^2+1)^(1/2))+I*a^2*arcsin(a*x)*polylog(2,-I*a*x-(-a^2*x^2+1)^(
1/2))-I*a^2*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-a^2*polylog(3,-
I*a*x-(-a^2*x^2+1)^(1/2))+a^2*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))-1/2*arcsi
n(a*x)^2*(-a^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.19, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {4789, 4803, 4268, 2611, 2320, 6724, 4723, 272, 65, 214}

$$ia^2\text{ArcSin}(ax)\text{Li}_2\left(-e^{i\text{ArcSin}(ax)}\right)-ia^2\text{ArcSin}(ax)\text{Li}_2\left(e^{i\text{ArcSin}(ax)}\right)-a^2\text{Li}_3\left(-e^{i\text{ArcSin}(ax)}\right)+a^2\text{Li}_3\left(e^{i\text{ArcSin}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{2x^2}+a^2\left(-\text{ArcSin}(ax)^2\right)\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)-a^2\tanh^{-1}\left(\sqrt{1-a^2x^2}\right)-\frac{a\text{ArcSin}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -((a*ArcSin[a*x])/x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*x^2) - a^2*ArcS
in[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcTanh[Sqrt[1 - a^2*x^2]] + I*a
^2*ArcSin[a*x]*PolyLog[2, -E^(I*ArcSin[a*x])] - I*a^2*ArcSin[a*x]*PolyLog[2
, E^(I*ArcSin[a*x])] - a^2*PolyLog[3, -E^(I*ArcSin[a*x])] + a^2*PolyLog[3,
E^(I*ArcSin[a*x])]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sin^{-1}(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx &= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2x^2} + a\int \frac{\sin^{-1}(ax)}{x^2}\,dx + \frac{1}{2}a^2\int \frac{\sin^{-1}(ax)^2}{x\sqrt{1-a^2x^2}}\,dx \\
&= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2x^2} + \frac{1}{2}a^2\text{Subst}\left(\int x^2\csc(x)\,dx, x, \sin^{-1}(ax)\right) \\
&= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + \frac{1}{2}a^2\text{S} \\
&= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + ia^2\sin \\
&= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\tan \\
&= -\frac{a\sin^{-1}(ax)}{x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{2x^2} - a^2\sin^{-1}(ax)^2\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2\tan
\end{aligned}$$

Mathematica [A]
time = 0.97, size = 194, normalized size = 1.19

$$\frac{1}{8}a^2\left(-4\text{ArcSin}(ax)\cot\left(\frac{1}{2}\text{ArcSin}(ax)\right) - \text{ArcSin}(ax)^2\csc^2\left(\frac{1}{2}\text{ArcSin}(ax)\right) + 4\text{ArcSin}(ax)^2\left(\log\left(1-e^{i\text{ArcSin}(ax)}\right) - \log\left(1+e^{i\text{ArcSin}(ax)}\right)\right) + 8\log\left(\tan\left(\frac{1}{2}\text{ArcSin}(ax)\right)\right) + 8i\text{ArcSin}(ax)\left(\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right) - \text{PolyLog}\left(2,e^{i\text{ArcSin}(ax)}\right)\right) + 8\left(-\text{PolyLog}\left(3,-e^{i\text{ArcSin}(ax)}\right) + \text{PolyLog}\left(3,e^{i\text{ArcSin}(ax)}\right)\right) + \text{ArcSin}(ax)^2\sec^2\left(\frac{1}{2}\text{ArcSin}(ax)\right) - 4\text{ArcSin}(ax)\tan\left(\frac{1}{2}\text{ArcSin}(ax)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*(-4*ArcSin[a*x]*Cot[ArcSin[a*x]/2] - ArcSin[a*x]^2*Csc[ArcSin[a*x]/2]^
2 + 4*ArcSin[a*x]^2*(Log[1 - E^(I*ArcSin[a*x])] - Log[1 + E^(I*ArcSin[a*x])
]) + 8*Log[Tan[ArcSin[a*x]/2]] + (8*I)*ArcSin[a*x]*(PolyLog[2, -E^(I*ArcSin
[a*x])] - PolyLog[2, E^(I*ArcSin[a*x])]) + 8*(-PolyLog[3, -E^(I*ArcSin[a*x]
)] + PolyLog[3, E^(I*ArcSin[a*x])]) + ArcSin[a*x]^2*Sec[ArcSin[a*x]/2]^2 -
4*ArcSin[a*x]*Tan[ArcSin[a*x]/2]))/8
```

Maple [A]
time = 0.29, size = 254, normalized size = 1.56

method	result
default	$-\frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)\left(a^2x^2\arcsin(ax)-2ax\sqrt{-a^2x^2+1}-\arcsin(ax)\right)}{2(a^2x^2-1)x^2}-\frac{a^2\left(-2i\arcsin(ax)\operatorname{polylog}\left(2,-iax-\sqrt{-\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*arcsin(a*x)*(a^2*x^2*arcsin(a*x)-2*
a*x*(-a^2*x^2+1)^(1/2)-arcsin(a*x))-1/2*a^2*(-2*I*arcsin(a*x)*polylog(2,-I*
a*x-(-a^2*x^2+1)^(1/2))+2*I*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))
+arcsin(a*x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))-arcsin(a*x)^2*ln(1-I*a*x-(-a^
2*x^2+1)^(1/2))+2*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))-2*polylog(3,I*a*x+(-
a^2*x^2+1)^(1/2))+4*arctanh(I*a*x+(-a^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^5 - x^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^2(ax)}{x^3\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/x**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**2/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{asin}(a\,x)^2}{x^3\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(x^3*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^2/(x^3*(1 - a^2*x^2)^(1/2)), x)
```

3.272 $\int \frac{\text{ArcSin}(ax)^2}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=42

$$\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

```
[Out] 1/3*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.045$, Rules used = $\{4737\}$

$$\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^2}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{3a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 42, normalized size = 1.00

$$\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.08, size = 52, normalized size = 1.24

method	result	size
default	$-\frac{\sqrt{-c\left(a^{2} x^{2}-1\right)}\,\sqrt{-a^{2} x^{2}+1}\,\arcsin\left(a x\right)^{3}}{3 a c\left(a^{2} x^{2}-1\right)}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c/(a^2*x^2-1)*arcsin(a*x)^
3
```

Maxima [A]
time = 0.48, size = 14, normalized size = 0.33

$$\frac{\arcsin\left(ax\right)^{3}}{3\,a\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*arcsin(a*x)^3/(a*sqrt(c))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^2*c*x^2 - c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{2}\left(ax\right)}{\sqrt{-c\left(ax-1\right)\left(ax+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**2/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{asin}(a\,x)^2}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(1/2),x)
```

```
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(1/2), x)
```

3.273 $\int \frac{\textbf{ArcSin}(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=179

$$\frac{x\text{ArcSin}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\,\text{Poly}}{ac\sqrt{}}$$

```
[Out] x*arcsin(a*x)^2/c/(-a^2*c*x^2+c)^(1/2)-I*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a
/c/(-a^2*c*x^2+c)^(1/2)+2*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-
a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)-I*polylog(2,-(I*a*x+(-a^2*x^2+1)^
(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4745, 4765, 3800, 2221, 2317, 2438}

$$-\frac{i\sqrt{1-a^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)^2}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{ac\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^2)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^2)/(a*c*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*Log[1 + E
^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*Pol
yLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sin^{-1}(ax)^2}{\left(c-a^2cx^2\right)^{3/2}}\,dx &= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{\left(2a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)}{1-a^2x^2}\,dx}{c\sqrt{c-a^2cx^2}} \\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{\left(2\sqrt{1-a^2x^2}\right)\operatorname{Subst}\left(\int x\tan(x)\,dx, x, \sin^{-1}(ax)\right)}{ac\sqrt{c-a^2cx^2}} \\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{\left(4i\sqrt{1-a^2x^2}\right)\operatorname{Subst}\left(\int \frac{e^{2ix}x}{1+e^{2ix}}\,dx, x, \sin\right.}{ac\sqrt{c-a^2cx^2}} \\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax}\right.}{ac\sqrt{c-a^2cx^2}} \\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax}\right.}{ac\sqrt{c-a^2cx^2}} \\
&= \frac{x\sin^{-1}(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)\log\left(1+e^{2i\sin^{-1}(ax}\right.}{ac\sqrt{c-a^2cx^2}}
\end{aligned}
$$

Mathematica [A]

time = 0.15, size = 108, normalized size = 0.60

$$\frac{\operatorname{ArcSin}(ax)\left(ax\operatorname{ArcSin}(ax)+\sqrt{1-a^2x^2}\left(-i\operatorname{ArcSin}(ax)+2\log\left(1+e^{2i\operatorname{ArcSin}(ax)}\right)\right)\right)-i\sqrt{1-a^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\operatorname{ArcSin}(ax)}\right)}{ac\sqrt{c(1-a^2x^2)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (ArcSin[a*x]*(a*x*ArcSin[a*x] + Sqrt[1 - a^2*x^2]*((-I)*ArcSin[a*x] + 2*Log
[1 + E^((2*I)*ArcSin[a*x])])) - I*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*Ar
cSin[a*x])])/(a*c*Sqrt[c*(1 - a^2*x^2)])
```

Maple [A]
time = 0.17, size = 169, normalized size = 0.94

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\left(i\sqrt{-a^2x^2+1}+ax\right)\arcsin(ax)^2}{c^2a(a^2x^2-1)}+\frac{i\sqrt{-a^2x^2+1}\sqrt{-c(a^2x^2-1)}\left(2i\arcsin(ax)\ln\left(\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)+a*x)*arcsin(a*x)^2/c^2/a/(a^2
*x^2-1)+I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)/c^2/a/(a^2*x^2-1)*(2*I*
arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(2,-(
I*a*x+(-a^2*x^2+1)^(1/2))^2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(3/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^2(ax)}{(-c(ax-1)(ax+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{asin}(a\,x)^2}{{(c-a^2\,c\,x^2)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(3/2), x)
```

3.274 $\int \frac{\mathbf{ArcSin}(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=283

$$\frac{x}{3c^2\sqrt{c-a^2cx^2}}-\frac{\text{ArcSin}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}}+\frac{2x\text{ArcSin}(ax)^2}{3c^2\sqrt{c-a^2cx^2}}-\frac{2i\sqrt{1-a^2x^2}\,\text{ArcSin}(}{3ac^2\sqrt{c-a^2cx^2}}$$

```
[Out] 1/3*x*arcsin(a*x)^2/c/(-a^2*c*x^2+c)^(3/2)+1/3*x/c^2/(-a^2*c*x^2+c)^(1/2)+2
/3*x*arcsin(a*x)^2/c^2/(-a^2*c*x^2+c)^(1/2)-1/3*arcsin(a*x)/a/c^2/(-a^2*x^2
+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-2/3*I*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a/c^2
/(-a^2*c*x^2+c)^(1/2)+4/3*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-
a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)-2/3*I*polylog(2,-(I*a*x+(-a^2*x
^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 283, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.409$, Rules used = {4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197}

$$-\frac{2i\sqrt{1-a^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}+\frac{2x\text{ArcSin}(ax)^2}{3c^2\sqrt{c-a^2cx^2}}-\frac{2i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{3ac^2\sqrt{c-a^2cx^2}}-\frac{\text{ArcSin}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}+\frac{4\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}}+\frac{x}{3c^2\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] x/(3*c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]/(3*a*c^2*Sqrt[1 - a^2*x^2]*Sqrt
[c - a^2*c*x^2]) + (x*ArcSin[a*x]^2)/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Arc
Sin[a*x]^2)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 - a^2*x^2]*ArcS
in[a*x]^2)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*L
og[1 + E^((2*I)*ArcSin[a*x])])/(3*a*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*S
qrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*
x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = \frac{x\sin^{-1}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2\int \frac{\sin^{-1}(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx}{3c} - \frac{\left(2a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)}{(1-a^2x^2)^2}\,dx}{3c^2\sqrt{c-a^2cx^2}}$$

$$= -\frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2x\sin^{-1}(ax)^2}{3c^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}}{3c^2\sqrt{\ldots}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2x\sin^{-1}(ax\ldots}{3c^2\sqrt{c-a^2c\ldots}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2x\sin^{-1}(ax\ldots}{3c^2\sqrt{c-a^2c\ldots}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2x\sin^{-1}(ax\ldots}{3c^2\sqrt{c-a^2c\ldots}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2x\sin^{-1}(ax\ldots}{3c^2\sqrt{c-a^2c\ldots}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{3ac^2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2x\sin^{-1}(ax\ldots}{3c^2\sqrt{c-a^2c\ldots}}$$

Mathematica [A]
time = 0.42, size = 149, normalized size = 0.53

$$\frac{ax+\left(-2i\sqrt{1-a^2x^2}+ax\left(2+\frac{1}{1-a^2x^2}\right)\right)\mathrm{ArcSin}(ax)^2+\frac{\mathrm{ArcSin}(ax)\left(-1+(4-4a^2x^2)\log\left(1+e^{2i\mathrm{ArcSin}(ax)}\right)\right)}{\sqrt{1-a^2x^2}}-2i\sqrt{1-a^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\mathrm{ArcSin}(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (a*x + ((-2*I)*Sqrt[1 - a^2*x^2] + a*x*(2 + (1 - a^2*x^2)^(-1)))*ArcSin[a*x
]^2 + (ArcSin[a*x]*(-1 + (4 - 4*a^2*x^2)*Log[1 + E^((2*I)*ArcSin[a*x])]))/S
qrt[1 - a^2*x^2] - (2*I)*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x]
)])/(3*a*c^2*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.22, size = 365, normalized size = 1.29

method	result
default	$-\frac{\sqrt{-c\left(a^{2}x^{2}-1\right)}\,\left(2i\sqrt{-a^{2}x^{2}+1}\,a^{2}x^{2}+2a^{3}x^{3}-2i\sqrt{-a^{2}x^{2}+1}\,-3ax\right)\left(-2i\arcsin\left(ax\right)a^{4}x^{4}-2\arcsin\left(ax\right)\sqrt{-a^{2}}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-2*I*(
-a^2*x^2+1)^(1/2)-3*a*x)*(-2*I*arcsin(a*x)*a^4*x^4-2*arcsin(a*x)*(-a^2*x^2+
1)^(1/2)*a^3*x^3+I*(-a^2*x^2+1)^(1/2)*a^3*x^3-a^4*x^4+3*arcsin(a*x)^2*a^2*x
^2+4*I*arcsin(a*x)*a^2*x^2+3*a*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)-I*(-a^2*x^2
+1)^(1/2)*a*x+3*a^2*x^2-4*arcsin(a*x)^2-2*I*arcsin(a*x)-2)/c^3/(3*a^6*x^6-1
0*a^4*x^4+11*a^2*x^2-4)/a+2/3*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(
2*I*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(
2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/a/c^3/(a^2*x^2-1)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(5/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 +
 3*a^2*c^3*x^2 - c^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{2}\left(ax\right)}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(5/2),x)
[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{asin}(a\,x)^2}{{\left(c-a^2\,c\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(5/2),x)
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(5/2), x)
```

3.275 $\int \frac{\textbf{ArcSin}(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx$

Optimal. Leaf size=390

$$\frac{x}{3c^3\sqrt{c-a^2cx^2}}+\frac{x}{30c^3(1-a^2x^2)\sqrt{c-a^2cx^2}}-\frac{\text{ArcSin}(ax)}{10ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}}-\frac{4\text{ArcSin}(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2c}}$$

```
[Out] 1/5*x*arcsin(a*x)^2/c/(-a^2*c*x^2+c)^(5/2)+4/15*x*arcsin(a*x)^2/c^2/(-a^2*c
*x^2+c)^(3/2)+1/3*x/c^3/(-a^2*c*x^2+c)^(1/2)+1/30*x/c^3/(-a^2*x^2+1)/(-a^2*
c*x^2+c)^(1/2)-1/10*arcsin(a*x)/a/c^3/(-a^2*x^2+1)^(3/2)/(-a^2*c*x^2+c)^(1/
2)+8/15*x*arcsin(a*x)^2/c^3/(-a^2*c*x^2+c)^(1/2)-4/15*arcsin(a*x)/a/c^3/(-a
^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-8/15*I*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2
)/a/c^3/(-a^2*c*x^2+c)^(1/2)+16/15*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/
2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)-8/15*I*polylog(2,-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.24, antiderivative size = 390, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.454$, Rules used = {4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 198}

$$-\frac{8i\sqrt{1-a^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}}+\frac{8x\text{ArcSin}(ax)^2}{15c^3\sqrt{c-a^2cx^2}}-\frac{8i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{15ac^3\sqrt{c-a^2cx^2}}-\frac{4\text{ArcSin}(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}-\frac{\text{ArcSin}(ax)}{10ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}}+\frac{16\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}}+\frac{4x\text{ArcSin}(ax)^2}{15c^2(c-a^2cx^2)^{3/2}}+\frac{x\text{ArcSin}(ax)^2}{5c(c-a^2cx^2)^{5/2}}+\frac{x}{3c^3\sqrt{c-a^2cx^2}}+\frac{x}{30c^3(1-a^2x^2)\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] x/(3*c^3*Sqrt[c - a^2*c*x^2]) + x/(30*c^3*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]
) - ArcSin[a*x]/(10*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - (4*Arc
Sin[a*x])/(15*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]
^2)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^2)/(15*c^2*(c - a^2*c*x^
2)^(3/2)) + (8*x*ArcSin[a*x]^2)/(15*c^3*Sqrt[c - a^2*c*x^2]) - (((8*I)/15)*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(a*c^3*Sqrt[c - a^2*c*x^2]) + (16*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]*Log[1 + E^((2*I)*ArcSin[a*x])])/(15*a*c^3*Sqrt[c - a^
2*c*x^2]) - (((8*I)/15)*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])
])/(a*c^3*Sqrt[c - a^2*c*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
```

```
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx = \frac{x\sin^{-1}(ax)^2}{5c\,(c-a^2cx^2)^{5/2}} + \frac{4\int \frac{\sin^{-1}(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx}{5c} - \frac{\left(2a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)}{(1-a^2x^2)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{\sin^{-1}(ax)}{10ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^2}{5c\,(c-a^2cx^2)^{5/2}} + \frac{4x\sin^{-1}(ax)^2}{15c^2\,(c-a^2cx^2)^{3/2}} + \frac{8\int \cdots}{\cdots}$$

$$= \frac{x}{30c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{4\sin^{-1}(a\cdots}{15ac^3\sqrt{1-a^2x^2}\,\cdots}$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)}{10ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \cdots$$

Mathematica [A]

time = 0.60, size = 234, normalized size = 0.60

$$\frac{\sqrt{1-a^2x^2}\left(\frac{a^3x^3}{(1-a^2x^2)^{3/2}}+\frac{11ax}{\sqrt{1-a^2x^2}}-16i\text{ArcSin}(ax)^2+\frac{16ax\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}+\frac{8\text{ArcSin}(ax)\left(-1+\frac{ax\text{ArcSin}(ax)}{\sqrt{1-a^2x^2}}\right)}{1-a^2x^2}+\frac{3\text{ArcSin}(ax)\left(-1+\frac{2ax\text{ArcSin}(ax)}{\sqrt{1-a^2x^2}}\right)}{(1-a^2x^2)^2}+32\text{ArcSin}(ax)\log\left(1+e^{2i\text{ArcSin}(ax)}\right)-16i\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(ax)}\right)\right)}{30ac^3\sqrt{c(1-a^2x^2)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*((a^3*x^3)/(1 - a^2*x^2)^(3/2) + (11*a*x)/Sqrt[1 - a^2*x
^2] - (16*I)*ArcSin[a*x]^2 + (16*a*x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2] + (8*
ArcSin[a*x]*(-1 + (a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2]))/(1 - a^2*x^2) + (3*
ArcSin[a*x]*(-1 + (2*a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2]))/(1 - a^2*x^2)^2 +
 32*ArcSin[a*x]*Log[1 + E^((2*I)*ArcSin[a*x])] - (16*I)*PolyLog[2, -E^((2*I
)*ArcSin[a*x])]))/(30*a*c^3*Sqrt[c*(1 - a^2*x^2)])
```

Maple [A]
time = 0.24, size = 556, normalized size = 1.43

method	result
default	$-\frac{\sqrt{-c\left(a^2x^2-1\right)}\left(8a^5x^5-20a^3x^3+8i\sqrt{-a^2x^2+1}\,a^4x^4+15ax-16i\sqrt{-a^2x^2+1}\,a^2x^2+8i\sqrt{-a^2x^2+1}\right)\left(\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/30*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/2)*a
^4*x^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+8*I*(-a^2*x^2+1)^(1/2))*(62*I
*(-a^2*x^2+1)^(1/2)*a*x+64*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^7*x^7+126*I*(-a
^2*x^2+1)^(1/2)*a^5*x^5+32*a^8*x^8+456*I*arcsin(a*x)*a^4*x^4-248*arcsin(a*x
)*(-a^2*x^2+1)^(1/2)*a^5*x^5-328*I*arcsin(a*x)*a^2*x^2-142*a^6*x^6+80*a^4*x
^4*arcsin(a*x)^2-32*I*(-a^2*x^2+1)^(1/2)*a^7*x^7+340*arcsin(a*x)*(-a^2*x^2+
1)^(1/2)*a^3*x^3+88*I*arcsin(a*x)+265*a^4*x^4-190*arcsin(a*x)^2*a^2*x^2+64*
I*arcsin(a*x)*a^8*x^8-165*a*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)-156*I*(-a^2*x^
2+1)^(1/2)*a^3*x^3-235*a^2*x^2+128*arcsin(a*x)^2-280*I*arcsin(a*x)*a^6*x^6+
80)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+287*a^2*x^2-64)/a
+8/15*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(2*I*arcsin(a*x)*ln(1+(I*
a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(2,-(I*a*x+(-a^2*x^2+1)^(
1/2))^2))/a/c^4/(a^2*x^2-1)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(7/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 +
6*a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{2}(ax)}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(7/2),x)
```

```
[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(7/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(7/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\mathrm{asin}\left(a\,x\right)}^2}{{\left(c-a^2\,c\,x^2\right)}^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(7/2),x)
```

```
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(7/2), x)
```

3.276 $\int x^m(d-c^2dx^2)^3(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=1312

$$\frac{2b^2c^2d^3x^{3+m}}{(3+m)(7+m)^2}+\frac{30b^2c^2d^3x^{3+m}}{(3+m)^2(5+m)(7+m)^2}+\frac{36b^2c^2d^3x^{3+m}}{(3+m)^2(5+m)^2(7+m)}+\frac{12b^2c^2d^3x^{3+m}}{(3+m)(5+m)^2(7+m)}+\frac{}{(3+}$$

```
[Out] -30*b*c*d^3*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(7+m)^2/(m^2+8*m+1
5)-10*b*c*d^3*x^(2+m)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(5+m)/(7+m)^2-12
*b*c*d^3*x^(2+m)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(5+m)^2/(7+m)+30*b^2*
c^2*d^3*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^
2*x^2)/(3+m)^2/(7+m)^2/(m^2+7*m+10)+48*b^2*c^2*d^3*x^(3+m)*hypergeom([1, 3/
2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(3+m)^3/(7+m)/(m^2+7*m+10
)+2*b^2*c^6*d^3*x^(7+m)/(7+m)^3+30*b^2*c^2*d^3*x^(3+m)/(3+m)^2/(5+m)/(7+m)^
2+12*b^2*c^2*d^3*x^(3+m)/(3+m)/(5+m)^2/(7+m)+48*b^2*c^2*d^3*x^(3+m)/(3+m)^3
/(5+m)/(7+m)-2*b*c*d^3*x^(2+m)*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/(7+m)^2
+36*b^2*c^2*d^3*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1
/2*m],c^2*x^2)/(m^2+8*m+15)^2/(m^2+9*m+14)+2*b^2*c^2*d^3*x^(3+m)/(3+m)/(7+m
)^2+36*b^2*c^2*d^3*x^(3+m)/(7+m)/(m^2+8*m+15)^2+10*b^2*c^2*d^3*x^(3+m)/(7+m
)^2/(m^2+8*m+15)-10*b^2*c^4*d^3*x^(5+m)/(5+m)^2/(7+m)^2-4*b^2*c^4*d^3*x^(5+
m)/(5+m)/(7+m)^2-12*b^2*c^4*d^3*x^(5+m)/(5+m)^3/(7+m)+48*d^3*x^(1+m)*(a+b*a
rcsin(c*x))^2/(5+m)/(7+m)/(m^2+4*m+3)+24*d^3*x^(1+m)*(-c^2*x^2+1)*(a+b*arcs
in(c*x))^2/(7+m)/(m^2+8*m+15)+6*d^3*x^(1+m)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x)
)^2/(5+m)/(7+m)-30*b*c*d^3*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*
m],[2+1/2*m],c^2*x^2)/(5+m)/(7+m)^2/(m^2+5*m+6)-36*b*c*d^3*x^(2+m)*(a+b*arc
sin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(5+m)^2/(7+m)/(m^2+5*
m+6)-48*b*c*d^3*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m
],c^2*x^2)/(3+m)^2/(7+m)/(m^2+7*m+10)-96*b*c*d^3*x^(2+m)*(a+b*arcsin(c*x))*
hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(5+m)/(7+m)/(m^3+6*m^2+11*m+6)+
96*b^2*c^2*d^3*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/
2*m],c^2*x^2)/(3+m)^2/(5+m)/(7+m)/(m^2+3*m+2)-48*b*c*d^3*x^(2+m)*(a+b*arcsi
n(c*x))*(-c^2*x^2+1)^(1/2)/(3+m)^2/(5+m)/(7+m)-36*b*c*d^3*x^(2+m)*(a+b*arcs
in(c*x))*(-c^2*x^2+1)^(1/2)/(3+m)/(5+m)^2/(7+m)+d^3*x^(1+m)*(-c^2*x^2+1)^3*
(a+b*arcsin(c*x))^2/(7+m)
```

Rubi [A]

time = 1.21, antiderivative size = 1312, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4787, 4723, 4805, 4783, 30, 14, 276}

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (2*b^2*c^2*d^3*x^(3 + m))/((3 + m)*(7 + m)^2) + (30*b^2*c^2*d^3*x^(3 + m))/
((3 + m)^2*(5 + m)*(7 + m)^2) + (36*b^2*c^2*d^3*x^(3 + m))/((3 + m)^2*(5 +
m)^2*(7 + m)) + (12*b^2*c^2*d^3*x^(3 + m))/((3 + m)*(5 + m)^2*(7 + m)) + (4
8*b^2*c^2*d^3*x^(3 + m))/((3 + m)^3*(5 + m)*(7 + m)) + (10*b^2*c^2*d^3*x^(3
 + m))/((7 + m)^2*(15 + 8*m + m^2)) - (10*b^2*c^4*d^3*x^(5 + m))/((5 + m)^2
*(7 + m)^2) - (4*b^2*c^4*d^3*x^(5 + m))/((5 + m)*(7 + m)^2) - (12*b^2*c^4*d
^3*x^(5 + m))/((5 + m)^3*(7 + m)) + (2*b^2*c^6*d^3*x^(7 + m))/(7 + m)^3 - (
36*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((3 + m)*(5 + m
)^2*(7 + m)) - (48*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/((3 + m)^2*(5 + m)*(7 + m)) - (30*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x]))/((7 + m)^2*(15 + 8*m + m^2)) - (10*b*c*d^3*x^(2 + m)*(1 -
c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((5 + m)*(7 + m)^2) - (12*b*c*d^3*x^(2
+ m)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((5 + m)^2*(7 + m)) - (2*b*c*
d^3*x^(2 + m)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(7 + m)^2 + (48*d^3*
x^(1 + m)*(a + b*ArcSin[c*x])^2)/((5 + m)*(7 + m)*(3 + 4*m + m^2)) + (24*d^
3*x^(1 + m)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((7 + m)*(15 + 8*m + m^2))
 + (6*d^3*x^(1 + m)*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/((5 + m)*(7 + m)
) + (d^3*x^(1 + m)*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(7 + m) - (48*b*c
*d^3*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m
)/2, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)*(7 + m)) - (30*b*c*d^3*x^(2 + m)*
(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/
((5 + m)*(7 + m)^2*(6 + 5*m + m^2)) - (36*b*c*d^3*x^(2 + m)*(a + b*ArcSin[c
*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((5 + m)^2*(7 +
 m)*(6 + 5*m + m^2)) - (96*b*c*d^3*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeome
tric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((5 + m)*(7 + m)*(6 + 11*m + 6
*m^2 + m^3)) + (30*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3
/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)*(7 +
m)^2) + (36*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/
2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)^2*(7 + m)) +
 (48*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2
+ m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3*(5 + m)*(7 + m)) + (96*b^2*
c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/
2 + m/2}, c^2*x^2])/((3 + m)^2*(5 + m)*(7 + m)*(2 + 3*m + m^2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int x^m \left(d-c^2 d x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2 \, dx = \int x^m \left(d-c^2 d x^2\right)^3 \left(a+b \sin^{-1}(cx)\right)^2 \, dx$$

Mathematica [F]
time = 3.12, size = 0, normalized size = 0.00

$$\int x^m \left(d-c^2 d x^2\right)^3 (a+b\text{ArcSin}(cx))^2 \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2, x]
```

Maple [F]
time = 9.44, size = 0, normalized size = 0.00

$$\int x^m \left(-c^2 d x^2+d\right)^3 (a+b \arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -a^2*c^6*d^3*x^(m + 7)/(m + 7) + 3*a^2*c^4*d^3*x^(m + 5)/(m + 5) - 3*a^2*c^
2*d^3*x^(m + 3)/(m + 3) + a^2*d^3*x^(m + 1)/(m + 1) - (((b^2*c^6*d^3*m^3 +
9*b^2*c^6*d^3*m^2 + 23*b^2*c^6*d^3*m + 15*b^2*c^6*d^3)*x^7 - 3*(b^2*c^4*d^3
*m^3 + 11*b^2*c^4*d^3*m^2 + 31*b^2*c^4*d^3*m + 21*b^2*c^4*d^3)*x^5 + 3*(b^2
*c^2*d^3*m^3 + 13*b^2*c^2*d^3*m^2 + 47*b^2*c^2*d^3*m + 35*b^2*c^2*d^3)*x^3
- (b^2*d^3*m^3 + 15*b^2*d^3*m^2 + 71*b^2*d^3*m + 105*b^2*d^3)*x)*x^m*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + (m^4 + 16*m^3 + 86*m^2 + 176*m + 1
05)*integrate(-2*(((b^2*c^7*d^3*m^3 + 9*b^2*c^7*d^3*m^2 + 23*b^2*c^7*d^3*m
+ 15*b^2*c^7*d^3)*x^7 - 3*(b^2*c^5*d^3*m^3 + 11*b^2*c^5*d^3*m^2 + 31*b^2*c^
5*d^3*m + 21*b^2*c^5*d^3)*x^5 + 3*(b^2*c^3*d^3*m^3 + 13*b^2*c^3*d^3*m^2 + 4
```

```
7*b^2*c^3*d^3*m + 35*b^2*c^3*d^3)*x^3 - (b^2*c*d^3*m^3 + 15*b^2*c*d^3*m^2 +
 71*b^2*c*d^3*m + 105*b^2*c*d^3)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (a*b*d^3*m^4 + (a*b*c^8*d^3*m^4 + 16
*a*b*c^8*d^3*m^3 + 86*a*b*c^8*d^3*m^2 + 176*a*b*c^8*d^3*m + 105*a*b*c^8*d^3
)*x^8 + 16*a*b*d^3*m^3 + 86*a*b*d^3*m^2 - 4*(a*b*c^6*d^3*m^4 + 16*a*b*c^6*d
^3*m^3 + 86*a*b*c^6*d^3*m^2 + 176*a*b*c^6*d^3*m + 105*a*b*c^6*d^3)*x^6 + 17
6*a*b*d^3*m + 105*a*b*d^3 + 6*(a*b*c^4*d^3*m^4 + 16*a*b*c^4*d^3*m^3 + 86*a*
b*c^4*d^3*m^2 + 176*a*b*c^4*d^3*m + 105*a*b*c^4*d^3)*x^4 - 4*(a*b*c^2*d^3*m
^4 + 16*a*b*c^2*d^3*m^3 + 86*a*b*c^2*d^3*m^2 + 176*a*b*c^2*d^3*m + 105*a*b*
c^2*d^3)*x^2)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(m^4 + 16*m^3
 - (c^2*m^4 + 16*c^2*m^3 + 86*c^2*m^2 + 176*c^2*m + 105*c^2)*x^2 + 86*m^2 +
 176*m + 105), x))/(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))*x^m, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2*x^m, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m (a + b \operatorname{asin}(c x))^2 \left(d - c^2 d x^2\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
```

```
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.277 $\int x^m(d-c^2dx^2)^2(a+b\text{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=756

$$\frac{6b^2c^2d^2x^{3+m}}{(3+m)^2(5+m)^2}+\frac{2b^2c^2d^2x^{3+m}}{(3+m)(5+m)^2}+\frac{8b^2c^2d^2x^{3+m}}{(3+m)^3(5+m)}-\frac{2b^2c^4d^2x^{5+m}}{(5+m)^3}-\frac{6bcd^2x^{2+m}\sqrt{1-c^2x^2}\,(a+b\text{ArcSi}}{(3+m)(5+m)^2}$$

```
[Out] 6*b^2*c^2*d^2*x^(3+m)/(3+m)^2/(5+m)^2+2*b^2*c^2*d^2*x^(3+m)/(3+m)/(5+m)^2+8
*b^2*c^2*d^2*x^(3+m)/(3+m)^3/(5+m)-2*b^2*c^4*d^2*x^(5+m)/(5+m)^3-2*b*c*d^2*
x^(2+m)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(5+m)^2+8*d^2*x^(1+m)*(a+b*arc
sin(c*x))^2/(5+m)/(m^2+4*m+3)+4*d^2*x^(1+m)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^
2/(m^2+8*m+15)+d^2*x^(1+m)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(5+m)-6*b*c*d
^2*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(5
+m)^2/(m^2+5*m+6)-8*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2
*m],[2+1/2*m],c^2*x^2)/(3+m)^2/(m^2+7*m+10)-16*b*c*d^2*x^(2+m)*(a+b*arcsin(
c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(5+m)/(m^3+6*m^2+11*m+6)+
8*b^2*c^2*d^2*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2
*m],c^2*x^2)/(2+m)/(3+m)^3/(5+m)+16*b^2*c^2*d^2*x^(3+m)*hypergeom([1, 3/2+1
/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(3+m)^2/(5+m)/(m^2+3*m+2)+6*
b^2*c^2*d^2*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m
],c^2*x^2)/(2+m)/(m^2+8*m+15)^2-6*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*x
^2+1)^(1/2)/(3+m)/(5+m)^2-8*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^
(1/2)/(3+m)^2/(5+m)
```

Rubi [A]
time = 0.61, antiderivative size = 756, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4787, 4723, 4805, 4783, 30, 14}

$$\frac{16b^2c^2d^2x^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+3)^2(m+5)(m^2+3m+2)}+\frac{8b^2c^2d^2x^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+2)(m+3)^3(m+5)}+\frac{6b^2c^2d^2x^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+2)(m+3)^2(m+5)^2}-\frac{6bcd^2x^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m+5)^2(m^2+5m+6)}-\frac{16bcd^2x^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m+5)(m^3+6m^2+11m+6)}-\frac{8bcd^2x^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m+2)(m+3)^2(m+5)}+\frac{4d^2(1-c^2x^2)x^{m+1}(a+b\text{ArcSin}(cx))^2}{m^2+8m+15}+\frac{d^2(1-c^2x^2)^2x^{m+1}(a+b\text{ArcSin}(cx))^2}{m+5}-\frac{2bcd^2(1-c^2x^2)^{3/2}x^{m+2}(a+b\text{ArcSin}(cx))}{(m+5)^2}-\frac{8bcd^2\sqrt{1-c^2x^2}\,x^{m+2}(a+b\text{ArcSin}(cx))}{(m+3)^2(m+5)}-\frac{6bcd^2\sqrt{1-c^2x^2}\,x^{m+2}(a+b\text{ArcSin}(cx))}{(m+3)(m+5)^2}+\frac{8d^2x^{m+1}(a+b\text{ArcSin}(cx))^2}{(m+5)(m^2+4m+3)}-\frac{2b^2c^4d^2x^{m+5}}{(m+5)^3}+\frac{8b^2c^2d^2x^{m+3}}{(m+3)^3(m+5)}+\frac{2b^2c^2d^2x^{m+3}}{(m+3)(m+5)^2}+\frac{6b^2c^2d^2x^{m+3}}{(m+3)^2(m+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (6*b^2*c^2*d^2*x^(3 + m))/((3 + m)^2*(5 + m)^2) + (2*b^2*c^2*d^2*x^(3 + m))
/((3 + m)*(5 + m)^2) + (8*b^2*c^2*d^2*x^(3 + m))/((3 + m)^3*(5 + m)) - (2*b
^2*c^4*d^2*x^(5 + m))/(5 + m)^3 - (6*b*c*d^2*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/((3 + m)*(5 + m)^2) - (8*b*c*d^2*x^(2 + m)*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/((3 + m)^2*(5 + m)) - (2*b*c*d^2*x^(2 + m)*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(5 + m)^2 + (8*d^2*x^(1 + m)*(a + b*ArcS
in[c*x])^2)/((5 + m)*(3 + 4*m + m^2)) + (4*d^2*x^(1 + m)*(1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/(15 + 8*m + m^2) + (d^2*x^(1 + m)*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/(5 + m) - (8*b*c*d^2*x^(2 + m)*(a + b*ArcSin[c*x])*Hyperge
ometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m))
 - (6*b*c*d^2*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/
```

```
2, (4 + m)/2, c^2*x^2])/((5 + m)^2*(6 + 5*m + m^2)) - (16*b*c*d^2*x^(2 + m)
*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])
/((5 + m)*(6 + 11*m + 6*m^2 + m^3)) + (6*b^2*c^2*d^2*x^(3 + m)*Hypergeometr
icPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(
3 + m)^2*(5 + m)^2) + (8*b^2*c^2*d^2*x^(3 + m)*HypergeometricPFQ[{1, 3/2 +
m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3*(5 + m)
) + (16*b^2*c^2*d^2*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2},
{2 + m/2, 5/2 + m/2}, c^2*x^2])/((3 + m)^2*(5 + m)*(2 + 3*m + m^2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int x^m (d - c^2 d x^2)^2 (a + b \sin^{-1}(cx))^2 \, dx = \int x^m (d - c^2 d x^2)^2 (a + b \sin^{-1}(cx))^2 \, dx$$

Mathematica [F]
time = 0.10, size = 0, normalized size = 0.00

$$\int x^m (d - c^2 d x^2)^2 (a + b\text{ArcSin}(cx))^2 \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2, x]
```

Maple [F]
time = 4.67, size = 0, normalized size = 0.00

$$\int x^m (-c^2 d x^2 + d)^2 (a + b \arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] a^2*c^4*d^2*x^(m + 5)/(m + 5) - 2*a^2*c^2*d^2*x^(m + 3)/(m + 3) + a^2*d^2*x
^(m + 1)/(m + 1) + (((b^2*c^4*d^2*m^2 + 4*b^2*c^4*d^2*m + 3*b^2*c^4*d^2)*x^
5 - 2*(b^2*c^2*d^2*m^2 + 6*b^2*c^2*d^2*m + 5*b^2*c^2*d^2)*x^3 + (b^2*d^2*m^
2 + 8*b^2*d^2*m + 15*b^2*d^2)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2 + (m^3 + 9*m^2 + 23*m + 15)*integrate(-2*(((b^2*c^5*d^2*m^2 + 4*b^2*
c^5*d^2*m + 3*b^2*c^5*d^2)*x^5 - 2*(b^2*c^3*d^2*m^2 + 6*b^2*c^3*d^2*m + 5*b
^2*c^3*d^2)*x^3 + (b^2*c*d^2*m^2 + 8*b^2*c*d^2*m + 15*b^2*c*d^2)*x)*sqrt(c*
x + 1)*sqrt(-c*x + 1)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (a*b
*d^2*m^3 - (a*b*c^6*d^2*m^3 + 9*a*b*c^6*d^2*m^2 + 23*a*b*c^6*d^2*m + 15*a*b
*c^6*d^2)*x^6 + 9*a*b*d^2*m^2 + 23*a*b*d^2*m + 3*(a*b*c^4*d^2*m^3 + 9*a*b*c
^4*d^2*m^2 + 23*a*b*c^4*d^2*m + 15*a*b*c^4*d^2)*x^4 + 15*a*b*d^2 - 3*(a*b*c
^2*d^2*m^3 + 9*a*b*c^2*d^2*m^2 + 23*a*b*c^2*d^2*m + 15*a*b*c^2*d^2)*x^2)*x^
m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(m^3 - (c^2*m^3 + 9*c^2*m^2 +
 23*c^2*m + 15*c^2)*x^2 + 9*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23*m + 15)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*x^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^{2}\left(\int a^{2} x^{m}\, dx + \int b^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\, dx + \int 2 a b x^{m} \operatorname{asin}{\left(c x \right)}\, dx + \int \left(- 2 a^{2} c^{2} x^{2} x^{m}\right)\, dx + \int a^{2} c^{4} x^{4} x^{m}\, dx + \int \left(- 2 b^{2} c^{2} x^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\right)\, dx + \int b^{2} c^{4} x^{4} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\, dx + \int \left(- 4 a b c^{2} x^{2} x^{m} \operatorname{asin}{\left(c x \right)}\right)\, dx + \int 2 a b c^{4} x^{4} x^{m} \operatorname{asin}{\left(c x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] d**2*(Integral(a**2*x**m, x) + Integral(b**2*x**m*asin(c*x)**2, x) + Integr
al(2*a*b*x**m*asin(c*x), x) + Integral(-2*a**2*c**2*x**2*x**m, x) + Integra
l(a**2*c**4*x**4*x**m, x) + Integral(-2*b**2*c**2*x**2*x**m*asin(c*x)**2, x
) + Integral(b**2*c**4*x**4*x**m*asin(c*x)**2, x) + Integral(-4*a*b*c**2*x*
*2*x**m*asin(c*x), x) + Integral(2*a*b*c**4*x**4*x**m*asin(c*x), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2*x^m, x)
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.278 $\int x^m(d-c^2dx^2)\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=371

$$\frac{2b^2c^2dx^{3+m}}{(3+m)^3}-\frac{2bcdx^{2+m}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{(3+m)^2}+\frac{2dx^{1+m}(a+b\text{ArcSin}(cx))^2}{3+4m+m^2}+\frac{dx^{1+m}(1-c^2x^2)\,(a+b\text{A}}{3+m}$$

```
[Out] 2*b^2*c^2*d*x^(3+m)/(3+m)^3+2*d*x^(1+m)*(a+b*arcsin(c*x))^2/(m^2+4*m+3)+d*x
^(1+m)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(3+m)-2*b*c*d*x^(2+m)*(a+b*arcsin(c
*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(2+m)/(3+m)^2-4*b*c*d*x^(2
+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(m^3+6*m^
2+11*m+6)+2*b^2*c^2*d*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m,
 5/2+1/2*m],c^2*x^2)/(2+m)/(3+m)^3+4*b^2*c^2*d*x^(3+m)*hypergeom([1, 3/2+1/
2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(3+m)^2/(m^2+3*m+2)-2*b*c*d*x
^(2+m)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(3+m)^2
```

Rubi [A]
time = 0.27, antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4787, 4723, 4805, 4783, 30}

$$\frac{4b^2c^2dx^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+3)^2\left(m^2+3m+2\right)}+\frac{2b^2c^2dx^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+2)(m+3)^3}-\frac{4bcdx^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{m^3+6m^2+11m+6}-\frac{2bcdx^{m+2}\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)(a+b\text{ArcSin}(cx))}{(m+2)(m+3)^2}+\frac{d\left(1-c^2x^2\right)x^{m+1}(a+b\text{ArcSin}(cx))^2}{m+3}-\frac{2bcd\sqrt{1-c^2x^2}\,x^{m+2}(a+b\text{ArcSin}(cx))}{(m+3)^2}+\frac{2dx^{m+1}(a+b\text{ArcSin}(cx))^2}{m^2+4m+3}+\frac{2b^2c^2dx^{m+3}}{(m+3)^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (2*b^2*c^2*d*x^(3 + m))/(3 + m)^3 - (2*b*c*d*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(3 + m)^2 + (2*d*x^(1 + m)*(a + b*ArcSin[c*x])^2)/(3 + 4
*m + m^2) + (d*x^(1 + m)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3 + m) - (2*
b*c*d*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 +
m)/2, c^2*x^2])/((2 + m)*(3 + m)^2) - (4*b*c*d*x^(2 + m)*(a + b*ArcSin[c*x]
)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(6 + 11*m + 6*m^2
+ m^3) + (2*b^2*c^2*d*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}
, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3) + (4*b^2*c^2*d*x^(3 +
 m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*
x^2])/((3 + m)^2*(2 + 3*m + m^2))
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
```

```
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int x^m(d-c^2dx^2)\left(a+b\sin^{-1}(cx)\right)^2\,dx=\int x^m(d-c^2dx^2)\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Mathematica [F]
time = 0.07, size = 0, normalized size = 0.00

$$\int x^m(d-c^2dx^2)\,(a+b\text{ArcSin}(cx))^2\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [F]
time = 2.29, size = 0, normalized size = 0.00

$$\int x^{m} \left(-c^{2} d \,x^{2}+d \right) \left(a +b \arcsin \left(c x \right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -a^2*c^2*d*x^(m + 3)/(m + 3) + a^2*d*x^(m + 1)/(m + 1) - (((b^2*c^2*d*m + b
^2*c^2*d)*x^3 - (b^2*d*m + 3*b^2*d)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))^2 + (m^2 + 4*m + 3)*integrate(2*(((b^2*c^3*d*m + b^2*c^3*d)*x^3
- (b^2*c*d*m + 3*b^2*c*d)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1)) + (a*b*d*m^2 + (a*b*c^4*d*m^2 + 4*a*b*c^4*d*m
 + 3*a*b*c^4*d)*x^4 + 4*a*b*d*m + 3*a*b*d - 2*(a*b*c^2*d*m^2 + 4*a*b*c^2*d*
m + 3*a*b*c^2*d)*x^2)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/((c^2
*m^2 + 4*c^2*m + 3*c^2)*x^2 - m^2 - 4*m - 3), x))/(m^2 + 4*m + 3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*x^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$- d \left(\int \left(- a^{2} x^{m}\right)\, dx + \int \left(- b^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\right)\, dx + \int \left(- 2 a b x^{m} \operatorname{asin}{\left(c x \right)}\right)\, dx + \int a^{2} c^{2} x^{2} x^{m}\, dx + \int b^{2} c^{2} x^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\, dx + \int 2 a b c^{2} x^{2} x^{m} \operatorname{asin}{\left(c x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] -d*(Integral(-a**2*x**m, x) + Integral(-b**2*x**m*asin(c*x)**2, x) + Integr
al(-2*a*b*x**m*asin(c*x), x) + Integral(a**2*c**2*x**2*x**m, x) + Integral(
b**2*c**2*x**2*x**m*asin(c*x)**2, x) + Integral(2*a*b*c**2*x**2*x**m*asin(c
*x), x))
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.279 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$

Optimal. Leaf size=30

$$\text{Int}\left(\frac{x^m(a+b\text{ArcSin}(cx))^2}{d-c^2dx^2},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x]
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx=\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{d-c^2dx^2}\,dx$$

Mathematica [A]
time = 4.35, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{d-c^2dx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x]
```

Maple [A]
time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(a+b\arcsin\left(cx\right)\right)^2}{-c^2d\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^2*d*x^2 - d)
, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x^m}{c^2x^2-1}\,dx+\int \frac{b^2x^m\operatorname{asin}^2{(cx)}}{c^2x^2-1}\,dx+\int \frac{2abx^m\operatorname{asin}{(cx)}}{c^2x^2-1}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**m/(c**2*x**2 - 1), x) + Integral(b**2*x**m*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**m*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m \left(a+b \operatorname{asin}(c\, x)\right)^2}{d-c^2\, d\, x^2} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.280 $\int \frac{x^m(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal. Leaf size=280

$$-\frac{bcx^{2+m}(a+b\text{ArcSin}(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}(a+b\text{ArcSin}(cx))^2}{2d^2(1-c^2x^2)}+\frac{bc(1+m)x^{2+m}(a+b\text{ArcSin}(cx))\text{Hypergeometric2}}{d^2(2+m)}$$

```
[Out] 1/2*x^(1+m)*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)+b*c*(1+m)*x^(2+m)*(a+b*arc
sin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^2/(2+m)+b^2*c^2*x^(
3+m)*hypergeom([1, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^2/(3+m)-b^2*c^2*(1+m)*
x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/d
^2/(m^2+5*m+6)-b*c*x^(2+m)*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)^(1/2)+1/2*(1-
m)*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)/d
```

Rubi [A]
time = 0.30, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (x^(1 + m)
*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2)) + (b*c*(1 + m)*x^(2 + m)*(a +
 b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d^2
*(2 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c
^2*x^2])/(d^2*(3 + m)) - (b^2*c^2*(1 + m)*x^(3 + m)*HypergeometricPFQ[{1, 3
/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(d^2*(6 + 5*m + m^2))
 + ((1 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x])/(2*
d)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^m(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^2}\,dx &= \frac{x^{1+m}(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)}-\frac{(bc)\int \frac{x^{1+m}(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d^2}+\frac{(1-m)\int \frac{x^m(a+b\sin^{-1}(}{d-c^2dx^2}}{2d} \\
&= -\frac{bcx^{2+m}(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)}+\frac{(b^2c^2)\int \frac{x^{2+m}}{1-c^2x^2}\,dx}{d^2}+ \\
&= -\frac{bcx^{2+m}(a+b\sin^{-1}(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}(a+b\sin^{-1}(cx))^2}{2d^2(1-c^2x^2)}+\frac{bc(1+m)x^{2+m}(a+b}{}
\end{aligned}$$

Mathematica [A]
time = 4.77, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2, x]
```

Maple [A]
time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(-c^2d\,x^2+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^4*d^2*x^4 - 2
*c^2*d^2*x^2 + d^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{a^2x^m}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{b^2x^m\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{2abx^m\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**m/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**m*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**m*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^2, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.281 $\int \frac{x^m(a+b\mathbf{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal. Leaf size=669

$$-\frac{bcx^{2+m}(a+b\text{ArcSin}(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc(1-m)x^{2+m}(a+b\text{ArcSin}(cx))}{6d^3\sqrt{1-c^2x^2}}-\frac{bc(3-m)x^{2+m}(a+b\text{ArcSin}(cx))}{4d^3\sqrt{1-c^2x^2}}+\frac{x^{1+m}(a}{4d^3}$$

```
[Out] -1/6*b*c*x^(2+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2)+1/4*x^(1+m)*(a+b*
arcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+1/8*(3-m)*x^(1+m)*(a+b*arcsin(c*x))^2/d^3
/(-c^2*x^2+1)+1/6*b*c*(1-m)*(1+m)*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2,
 1+1/2*m],[2+1/2*m],c^2*x^2)/d^3/(2+m)+1/4*b*c*(3-m)*(1+m)*x^(2+m)*(a+b*arc
sin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^3/(2+m)+1/6*b^2*c^2
*(1-m)*x^(3+m)*hypergeom([1, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^3/(3+m)+1/4*
b^2*c^2*(3-m)*x^(3+m)*hypergeom([1, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^3/(3+
m)+1/6*b^2*c^2*x^(3+m)*hypergeom([2, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^3/(3
+m)-1/6*b^2*c^2*(1-m)*(1+m)*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+
1/2*m, 5/2+1/2*m],c^2*x^2)/d^3/(m^2+5*m+6)-1/4*b^2*c^2*(3-m)*(1+m)*x^(3+m)*
hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/d^3/(m^2+
5*m+6)-1/6*b*c*(1-m)*x^(2+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(1/2)-1/4*b
*c*(3-m)*x^(2+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(1/2)+1/8*(1-m)*(3-m)*U
nintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)/d^2
```

Rubi [A]
time = 0.66, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/6*(b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(d^3*(1 - c^2*x^2)^(3/2)) - (b*c*(
1 - m)*x^(2 + m)*(a + b*ArcSin[c*x]))/(6*d^3*Sqrt[1 - c^2*x^2]) - (b*c*(3 -
 m)*x^(2 + m)*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) + (x^(1 + m)*(
a + b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m)*(a + b*A
rcSin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) + (b*c*(1 - m)*(1 + m)*x^(2 + m)*(a +
b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(6*d^
3*(2 + m)) + (b*c*(3 - m)*(1 + m)*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeomet
ric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 + m)) + (b^2*c^2*(1 -
 m)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(
3 + m)) + (b^2*c^2*(3 - m)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m
```

```
)/2, c^2*x^2])/(4*d^3*(3 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[2, (3
 + m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(3 + m)) - (b^2*c^2*(1 - m)*(1 + m)*x^
(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2},
c^2*x^2])/(6*d^3*(6 + 5*m + m^2)) - (b^2*c^2*(3 - m)*(1 + m)*x^(3 + m)*Hype
rgeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(4
*d^3*(6 + 5*m + m^2)) + ((1 - m)*(3 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x]
)^2)/(d - c^2*d*x^2), x])/(8*d^2)
```

Rubi steps

$$\int \frac{x^m(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{x^{1+m}(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x^{1+m}(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{2d^3} + \frac{(3-m)\int \frac{x^m(a+b\sin^{-1}(}{(d-c^2dx^2)}}{4d}$$

$$= -\frac{bcx^{2+m}(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} + \frac{x^{1+m}(a+b\sin^{-1}(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(3-m)x^{1+m}(a+b\sin}{8d^3(1-c^2x^2}$$

$$= -\frac{bcx^{2+m}(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(1-m)x^{2+m}(a+b\sin^{-1}(cx))}{6d^3\sqrt{1-c^2x^2}} - \frac{bc(3-m)x^{2}}{4d^3}$$

$$= -\frac{bcx^{2+m}(a+b\sin^{-1}(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(1-m)x^{2+m}(a+b\sin^{-1}(cx))}{6d^3\sqrt{1-c^2x^2}} - \frac{bc(3-m)x^{2}}{4d^3}$$

Mathematica [A]
time = 5.23, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3, x]
```

Maple [A]
time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(-c^2d\,x^2+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^6*d^3*x^6 -
3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2x^m}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{b^2x^m\operatorname{asin}^2{(cx)}}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{2abx^m\operatorname{asin}{(cx)}}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**m/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**m*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**m*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.282 $\int x^m(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=958

$$\frac{10b^2c^2d^2x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3(6+m)}+\frac{2b^2c^2d^2(52+15m+m^2)\,x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^2(6+m)^3}-\frac{2b^2c^4d^2x^{5+m}\sqrt{d-c^2dx^2}}{(6+m)^3}-\frac{30bcd^2x}{(2+}$$

```
[Out] 5*d*x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(4+m)/(6+m)+x^(1+m)*(-
c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(6+m)+10*b^2*c^2*d^2*x^(3+m)*(-c^2*d
*x^2+d)^(1/2)/(4+m)^3/(6+m)+2*b^2*c^2*d^2*(m^2+15*m+52)*x^(3+m)*(-c^2*d*x^2
+d)^(1/2)/(4+m)^2/(6+m)^3-2*b^2*c^4*d^2*x^(5+m)*(-c^2*d*x^2+d)^(1/2)/(6+m)^
3+15*d^2*x^(1+m)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(6+m)/(m^2+6*m+8)
-30*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(4+m)/(6
+m)/(-c^2*x^2+1)^(1/2)-10*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/(6+m)/(m^2+6*m+8)/(-c^2*x^2+1)^(1/2)-2*b*c*d^2*x^(2+m)*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/(m^2+8*m+12)/(-c^2*x^2+1)^(1/2)+10*b*c^3*d^2*x^(4+
m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(6+m)/(-c^2*x^2+1)^(1/2)+
4*b*c^3*d^2*x^(4+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(4+m)/(6+m)/(-c^
2*x^2+1)^(1/2)-2*b*c^5*d^2*x^(6+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(
6+m)^2/(-c^2*x^2+1)^(1/2)+10*b^2*c^2*d^2*(10+3*m)*x^(3+m)*hypergeom([1/2, 3
/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(4+m)^3/(6+m)/(m^2+5*m+
6)/(-c^2*x^2+1)^(1/2)+30*b^2*c^2*d^2*x^(3+m)*hypergeom([1/2, 3/2+1/2*m],[5/
2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(6+m)/(m^2+7*m+12)/(-c^2*x^2
+1)^(1/2)+2*b^2*c^2*d^2*(15*m^2+130*m+264)*x^(3+m)*hypergeom([1/2, 3/2+1/2*
m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(6+m)^3/(m^2+5*m+6)/(-
c^2*x^2+1)^(1/2)+15*d^3*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)
^(1/2),x)/(6+m)/(m^2+6*m+8)
```

Rubi [A]
time = 0.91, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int x^m\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))^2\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (10*b^2*c^2*d^2*x^(3 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^3*(6 + m)) + (2*b^2
*c^2*d^2*(52 + 15*m + m^2)*x^(3 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^2*(6 + m
)^3) - (2*b^2*c^4*d^2*x^(5 + m)*Sqrt[d - c^2*d*x^2])/(6 + m)^3 - (30*b*c*d^
2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*(4 + m)*(6
+ m)*Sqrt[1 - c^2*x^2]) - (10*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*
```

```
ArcSin[c*x]))/((6 + m)*(8 + 6*m + m^2)*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*x^(2
 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((12 + 8*m + m^2)*Sqrt[1 - c
^2*x^2]) + (10*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/((4 + m)^2*(6 + m)*Sqrt[1 - c^2*x^2]) + (4*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x]))/((4 + m)*(6 + m)*Sqrt[1 - c^2*x^2]) - (2*b*c^
5*d^2*x^(6 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((6 + m)^2*Sqrt[1
- c^2*x^2]) + (15*d^2*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/
((6 + m)*(8 + 6*m + m^2)) + (5*d*x^(1 + m)*(d - c^2*d*x^2)^(3/2)*(a + b*Arc
Sin[c*x])^2)/((4 + m)*(6 + m)) + (x^(1 + m)*(d - c^2*d*x^2)^(5/2)*(a + b*Ar
cSin[c*x])^2)/(6 + m) + (30*b^2*c^2*d^2*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hyper
geometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(3 + m)*(4 + m
)*(6 + m)*Sqrt[1 - c^2*x^2]) + (10*b^2*c^2*d^2*(10 + 3*m)*x^(3 + m)*Sqrt[d
- c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m
)*(3 + m)*(4 + m)^3*(6 + m)*Sqrt[1 - c^2*x^2]) + (2*b^2*c^2*d^2*(264 + 130*
m + 15*m^2)*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2,
 (5 + m)/2, c^2*x^2])/((2 + m)*(3 + m)*(4 + m)^2*(6 + m)^3*Sqrt[1 - c^2*x^2
]) + (15*d^3*Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
)/((6 + m)*(8 + 6*m + m^2))
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx=\int x^m \left(d-c^2dx^2\right)^{5/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Mathematica [A]
time = 4.70, size = 0, normalized size = 0.00

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\text{ArcSin}(cx))^2 \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 7.89, size = 0, normalized size = 0.00

$$\int x^m \left(-c^2d\,x^2+d\right)^{\frac{5}{2}} \left(a+b\arcsin\left(cx\right)\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m (a + b \operatorname{asin}(c x))^2 \left(d - c^2 d x^2\right)^{5/2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.283 $\int x^m(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=500

$$\frac{2b^2c^2dx^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3}-\frac{6bcdx^{2+m}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{(2+m)^2(4+m)\sqrt{1-c^2x^2}}-\frac{2bcdx^{2+m}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx)}{(8+6m+m^2)\sqrt{1-c^2x^2}}$$

```
[Out] x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(4+m)+2*b^2*c^2*d*x^(3+m)*
(-c^2*d*x^2+d)^(1/2)/(4+m)^3+3*d*x^(1+m)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)
^(1/2)/(m^2+6*m+8)-6*b*c*d*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(
2+m)^2/(4+m)/(-c^2*x^2+1)^(1/2)-2*b*c*d*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x
^2+d)^(1/2)/(m^2+6*m+8)/(-c^2*x^2+1)^(1/2)+2*b*c^3*d*x^(4+m)*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(-c^2*x^2+1)^(1/2)+2*b^2*c^2*d*(10+3*m)*x^
(3+m)*hypergeom([1/2, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/
(4+m)^3/(m^2+5*m+6)/(-c^2*x^2+1)^(1/2)+6*b^2*c^2*d*x^(3+m)*hypergeom([1/2,
3/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(m^2+7*m+12)/(
-c^2*x^2+1)^(1/2)+3*d^2*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)
^(1/2),x)/(m^2+6*m+8)
```

Rubi [A]
time = 0.44, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int x^m(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^2\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (2*b^2*c^2*d*x^(3 + m)*Sqrt[d - c^2*d*x^2])/(4 + m)^3 - (6*b*c*d*x^(2 + m)*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*(4 + m)*Sqrt[1 - c^2*x^
2]) - (2*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((8 + 6*m
 + m^2)*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^(4 + m)*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x]))/((4 + m)^2*Sqrt[1 - c^2*x^2]) + (3*d*x^(1 + m)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^2)/(8 + 6*m + m^2) + (x^(1 + m)*(d - c^2*d*x^2)
^(3/2)*(a + b*ArcSin[c*x])^2)/(4 + m) + (6*b^2*c^2*d*x^(3 + m)*Sqrt[d - c^2
*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(
3 + m)*(4 + m)*Sqrt[1 - c^2*x^2]) + (2*b^2*c^2*d*(10 + 3*m)*x^(3 + m)*Sqrt[
d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 +
 m)*(3 + m)*(4 + m)^3*Sqrt[1 - c^2*x^2]) + (3*d^2*Defer[Int][(x^m*(a + b*Ar
cSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x])/(8 + 6*m + m^2)
```

Rubi steps

$$\int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx = \int x^m \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^2 \, dx$$

Mathematica [A]
time = 0.11, size = 0, normalized size = 0.00

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\text{ArcSin}(cx))^2 \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 3.49, size = 0, normalized size = 0.00

$$\int x^m \left(-c^2 d\,x^2+d\right)^{\frac{3}{2}} (a+b\arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3004 deep
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.284 $\int x^m\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=204

$$-\frac{2bcx^{2+m}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2}{2+m}+\frac{2b^2c^2x^{3+m}\sqrt{d-c^2dx^2}\,\text{H}}{(2+m)}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(2+m)-2*b*c*x^(2+m)*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(-c^2*x^2+1)^(1/2)+2*b^2*c^2*x^(3+
m)*hypergeom([1/2, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+
m)^2/(3+m)/(-c^2*x^2+1)^(1/2)+d*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*
d*x^2+d)^(1/2),x)/(2+m)
```

Rubi [A]
time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int x^m\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-2*b*c*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*Sqrt[
1 - c^2*x^2]) + (x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2 +
m) + (2*b^2*c^2*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m
)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(3 + m)*Sqrt[1 - c^2*x^2]) + (d*Defer[
Int][(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x])/(2 + m)
```

Rubi steps

$$\int x^m\sqrt{d-c^2dx^2}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx=\int x^m\sqrt{d-c^2dx^2}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

Mathematica [A]
time = 0.08, size = 0, normalized size = 0.00

$$\int x^m\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^2\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 1.44, size = 0, normalized size = 0.00

$$\int x^{m} \sqrt{-c^{2} d \,x^{2}+d}\, \left(a +b \arcsin \left(c x \right)\right)^{2}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*x^m, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^{m} \sqrt{- d \left(c x - 1\right) \left(c x + 1\right)} \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**m*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\sqrt{d-c^2\,d\,x^2}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.285 $\int \frac{x^m(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{x^m(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
```

Rubi steps

$$\int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^m\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d-c^2dx^2}}\,dx$$

Mathematica [A]
time = 2.38, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
```

Maple [A]
time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(a+b\arcsin\left(cx\right)\right)^2}{\sqrt{-c^2d\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m (a + b \operatorname{asin}(cx))^2}{\sqrt{-d (cx - 1) (cx + 1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.286 $\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

Rubi [A]
time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^m(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^m(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

Mathematica [A]
time = 2.85, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2), x]
```

Maple [A]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(-c^2d\,x^2+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*x^m/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}(a+b\operatorname{asin}(cx))^{2}}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Warning, integration of abs or sign a
ssumes constant sign by intervals (correct if the argument is real):Check [
abs(t_
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}{\left(d-c^2\,d\,x^2\right)^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.287 $\int \frac{x^m(a+b\textbf{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

Rubi [A]
time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^m(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^m(a+b\sin^{-1}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

Mathematica [A]
time = 2.97, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\text{ArcSin}(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2), x]
```

Maple [A]
time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(-c^2d\,x^2+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)*x^m/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m (a + b \operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.288 $\int \frac{x^m \textbf{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{x^m\mathrm{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m\mathrm{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
[Out] Defer[Int][(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\int \frac{x^m\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx=\int \frac{x^m\sin^{-1}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A]
time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{x^m\mathrm{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
[Out] Integrate[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2], x]
```

Maple [A]
time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{x^m\arcsin(ax)^2}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^2/(a^2*x^2 - 1), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \operatorname{asin}^2(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)**2/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^m*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.289 $\int (c-a^2cx^2)^3 \operatorname{ArcSin}(ax)^3 \, dx$

Optimal. Leaf size=370

$$-\frac{413312c^3\sqrt{1-a^2x^2}}{128625a}-\frac{30256c^3(1-a^2x^2)^{3/2}}{385875a}-\frac{2664c^3(1-a^2x^2)^{5/2}}{214375a}-\frac{6c^3(1-a^2x^2)^{7/2}}{2401a}-\frac{4322c^3x\operatorname{ArcSin}(ax)}{1225}$$

```
[Out] -30256/385875*c^3*(-a^2*x^2+1)^(3/2)/a-2664/214375*c^3*(-a^2*x^2+1)^(5/2)/a
-6/2401*c^3*(-a^2*x^2+1)^(7/2)/a-4322/1225*c^3*x*arcsin(a*x)+1514/3675*a^2*
c^3*x^3*arcsin(a*x)-702/6125*a^4*c^3*x^5*arcsin(a*x)+6/343*a^6*c^3*x^7*arcs
in(a*x)+8/35*c^3*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2/a+18/175*c^3*(-a^2*x^2+1)
^(5/2)*arcsin(a*x)^2/a+3/49*c^3*(-a^2*x^2+1)^(7/2)*arcsin(a*x)^2/a+16/35*c^
3*x*arcsin(a*x)^3+8/35*c^3*x*(-a^2*x^2+1)*arcsin(a*x)^3+6/35*c^3*x*(-a^2*x^
2+1)^2*arcsin(a*x)^3+1/7*c^3*x*(-a^2*x^2+1)^3*arcsin(a*x)^3-413312/128625*c
^3*(-a^2*x^2+1)^(1/2)/a+48/35*c^3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a
```

Rubi [A]
time = 0.51, antiderivative size = 370, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 13, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.650$,
Rules used = {4743, 4715, 4767, 267, 4739, 455, 45, 200, 12, 1261, 712, 1813, 1864}

$$\frac{6}{343}a^6c^3x^7\operatorname{ArcSin}(ax)-\frac{702a^4c^3x^5\operatorname{ArcSin}(ax)}{6125}+\frac{1514a^2c^3x^3\operatorname{ArcSin}(ax)}{3675}+\frac{1}{7}c^3x(1-a^2x^2)^3\operatorname{ArcSin}(ax)^3+\frac{6}{35}c^3x(1-a^2x^2)^2\operatorname{ArcSin}(ax)^3+\frac{8}{35}c^3x(1-a^2x^2)\operatorname{ArcSin}(ax)^3+\frac{3c^3(1-a^2x^2)^{7/2}\operatorname{ArcSin}(ax)^2}{49a}+\frac{18c^3(1-a^2x^2)^{5/2}\operatorname{ArcSin}(ax)^2}{175a}+\frac{8c^3(1-a^2x^2)^{3/2}\operatorname{ArcSin}(ax)^2}{35a}+\frac{48c^3\sqrt{1-a^2x^2}\operatorname{ArcSin}(ax)^2}{35a}-\frac{6c^3(1-a^2x^2)^{7/2}}{2401a}-\frac{2664c^3(1-a^2x^2)^{5/2}}{214375a}-\frac{30256c^3(1-a^2x^2)^{3/2}}{385875a}-\frac{413312c^3\sqrt{1-a^2x^2}}{128625a}+\frac{16}{35}c^3x\operatorname{ArcSin}(ax)^3-\frac{4322c^3x\operatorname{ArcSin}(ax)}{1225}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^3*ArcSin[a*x]^3,x]
```

```
[Out] (-413312*c^3*Sqrt[1 - a^2*x^2])/(128625*a) - (30256*c^3*(1 - a^2*x^2)^(3/2)
)/(385875*a) - (2664*c^3*(1 - a^2*x^2)^(5/2))/(214375*a) - (6*c^3*(1 - a^2*
x^2)^(7/2))/(2401*a) - (4322*c^3*x*ArcSin[a*x])/1225 + (1514*a^2*c^3*x^3*Ar
cSin[a*x])/3675 - (702*a^4*c^3*x^5*ArcSin[a*x])/6125 + (6*a^6*c^3*x^7*ArcSi
n[a*x])/343 + (48*c^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(35*a) + (8*c^3*(1 -
 a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(35*a) + (18*c^3*(1 - a^2*x^2)^(5/2)*ArcSin[
a*x]^2)/(175*a) + (3*c^3*(1 - a^2*x^2)^(7/2)*ArcSin[a*x]^2)/(49*a) + (16*c^
3*x*ArcSin[a*x]^3)/35 + (8*c^3*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/35 + (6*c^3*x
*(1 - a^2*x^2)^2*ArcSin[a*x]^3)/35 + (c^3*x*(1 - a^2*x^2)^3*ArcSin[a*x]^3)/
7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^3 \sin^{-1}(ax)^3\,dx = \frac{1}{7}c^3x\left(1-a^2x^2\right)^3 \sin^{-1}(ax)^3 + \frac{1}{7}(6c)\int \left(c-a^2cx^2\right)^2 \sin^{-1}(ax)^3\,dx - \frac{1}{7}(3ac$$

$$= \frac{3c^3(1-a^2x^2)^{7/2}\sin^{-1}(ax)^2}{49a} + \frac{6}{35}c^3x\left(1-a^2x^2\right)^2\sin^{-1}(ax)^3 + \frac{1}{7}c^3x\left(1-a^2\right.$$

$$= -\frac{6}{49}c^3x\sin^{-1}(ax) + \frac{6}{49}a^2c^3x^3\sin^{-1}(ax) - \frac{18}{245}a^4c^3x^5\sin^{-1}(ax) + \frac{6}{343}a^6c^3$$

$$= -\frac{402c^3x\sin^{-1}(ax)}{1225} + \frac{318a^2c^3x^3\sin^{-1}(ax)}{1225} - \frac{702a^4c^3x^5\sin^{-1}(ax)}{6125} + \frac{6}{343}a^6$$

$$= -\frac{962c^3x\sin^{-1}(ax)}{1225} + \frac{1514a^2c^3x^3\sin^{-1}(ax)}{3675} - \frac{702a^4c^3x^5\sin^{-1}(ax)}{6125} + \frac{6}{343}c$$

$$= -\frac{4322c^3x\sin^{-1}(ax)}{1225} + \frac{1514a^2c^3x^3\sin^{-1}(ax)}{3675} - \frac{702a^4c^3x^5\sin^{-1}(ax)}{6125} + \frac{6}{343}$$

$$= -\frac{960c^3\sqrt{1-a^2x^2}}{343a} - \frac{16c^3(1-a^2x^2)^{3/2}}{1715a} - \frac{36c^3(1-a^2x^2)^{5/2}}{8575a} - \frac{6c^3(1-a^2}{2401a}$$

$$= -\frac{413312c^3\sqrt{1-a^2x^2}}{128625a} - \frac{30256c^3(1-a^2x^2)^{3/2}}{385875a} - \frac{2664c^3(1-a^2x^2)^{5/2}}{214375a} - 6$$

Mathematica [A]
time = 0.15, size = 171, normalized size = 0.46

$$\frac{c^3\left(2\sqrt{1-a^2x^2}\,(-22329151+747937a^2x^2-134541a^4x^4+16875a^6x^6)+210ax(-226905+26495a^2x^2-7371a^4x^4+1125a^6x^6)\,\mathrm{ArcSin}(ax)-11025\sqrt{1-a^2x^2}\,(-2161+757a^2x^2-351a^4x^4+75a^6x^6)\,\mathrm{ArcSin}(ax)^2-385875ax(-35+35a^2x^2-21a^4x^4+5a^6x^6)\,\mathrm{ArcSin}(ax)^3\right)}{13505625a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^3*ArcSin[a*x]^3,x]
```

```
[Out] (c^3*(2*Sqrt[1 - a^2*x^2]*(-22329151 + 747937*a^2*x^2 - 134541*a^4*x^4 + 16
875*a^6*x^6) + 210*a*x*(-226905 + 26495*a^2*x^2 - 7371*a^4*x^4 + 1125*a^6*x
^6)*ArcSin[a*x] - 11025*Sqrt[1 - a^2*x^2]*(-2161 + 757*a^2*x^2 - 351*a^4*x^
4 + 75*a^6*x^6)*ArcSin[a*x]^2 - 385875*a*x*(-35 + 35*a^2*x^2 - 21*a^4*x^4 +
 5*a^6*x^6)*ArcSin[a*x]^3))/(13505625*a)
```

Maple [A]
time = 0.17, size = 278, normalized size = 0.75

method	result

derivativedivides	$-\frac{c^3\left(1929375\arcsin(ax)^3a^7x^7+826875\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^6x^6-8103375a^5x^5\arcsin(ax)^3-236250\arcsin(a$
default	$-\frac{c^3\left(1929375\arcsin(ax)^3a^7x^7+826875\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^6x^6-8103375a^5x^5\arcsin(ax)^3-236250\arcsin(a$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/13505625/a*c^3*(1929375*arcsin(a*x)^3*a^7*x^7+826875*arcsin(a*x)^2*(-a^2
*x^2+1)^(1/2)*a^6*x^6-8103375*a^5*x^5*arcsin(a*x)^3-236250*arcsin(a*x)*a^7*
x^7-3869775*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^4*x^4-33750*(-a^2*x^2+1)^(1/
2)*a^6*x^6+13505625*a^3*x^3*arcsin(a*x)^3+1547910*a^5*x^5*arcsin(a*x)+83459
25*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x^2+269082*a^4*x^4*(-a^2*x^2+1)^(1/
2)-13505625*a*x*arcsin(a*x)^3-5563950*a^3*x^3*arcsin(a*x)-23825025*arcsin(a
*x)^2*(-a^2*x^2+1)^(1/2)-1495874*a^2*x^2*(-a^2*x^2+1)^(1/2)+47650050*a*x*ar
csin(a*x)+44658302*(-a^2*x^2+1)^(1/2))
```

Maxima [A]
time = 0.49, size = 284, normalized size = 0.77

$$-\frac{1}{1225}\left(75\sqrt{-a^2x^2+1}\,a^4c^3x^6-351\sqrt{-a^2x^2+1}\,a^2c^3x^4+757\sqrt{-a^2x^2+1}\,c^3x^2-\frac{2161\sqrt{-a^2x^2+1}\,c^3}{a^2}\right)a\arcsin(ax)^2-\frac{1}{35}\left(5a^6c^3x^7-21a^4c^3x^5+35a^2c^3x^3-35c^3x\right)\arcsin(ax)^3+\frac{2}{13505625}\left(16875\sqrt{-a^2x^2+1}\,a^4c^3x^6-134541\sqrt{-a^2x^2+1}\,a^2c^3x^4+747937\sqrt{-a^2x^2+1}\,c^3x^2-\frac{22329151\sqrt{-a^2x^2+1}\,c^3}{a^2}+\frac{105\left(1125a^6c^3x^7-7371a^4c^3x^5+26495a^2c^3x^3-226905c^3x\right)\arcsin(ax)}{a}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/1225*(75*sqrt(-a^2*x^2 + 1)*a^4*c^3*x^6 - 351*sqrt(-a^2*x^2 + 1)*a^2*c^3
*x^4 + 757*sqrt(-a^2*x^2 + 1)*c^3*x^2 - 2161*sqrt(-a^2*x^2 + 1)*c^3/a^2)*a*
arcsin(a*x)^2 - 1/35*(5*a^6*c^3*x^7 - 21*a^4*c^3*x^5 + 35*a^2*c^3*x^3 - 35*
c^3*x)*arcsin(a*x)^3 + 2/13505625*(16875*sqrt(-a^2*x^2 + 1)*a^4*c^3*x^6 - 1
34541*sqrt(-a^2*x^2 + 1)*a^2*c^3*x^4 + 747937*sqrt(-a^2*x^2 + 1)*c^3*x^2 -
22329151*sqrt(-a^2*x^2 + 1)*c^3/a^2 + 105*(1125*a^6*c^3*x^7 - 7371*a^4*c^3*
x^5 + 26495*a^2*c^3*x^3 - 226905*c^3*x)*arcsin(a*x)/a)*a
```

Fricas [A]
time = 1.42, size = 202, normalized size = 0.55

$$-\frac{385875\left(5a^7c^3x^7-21a^5c^3x^5+35a^3c^3x^3-35ac^3x\right)\arcsin(ax)^3-210\left(1125a^7c^3x^7-7371a^5c^3x^5+26495a^3c^3x^3-226905ac^3x\right)\arcsin(ax)-\left(33750a^6c^3x^6-269082a^4c^3x^4+1495874a^2c^3x^2-44658302c^3-11025\left(75a^6c^3x^6-351a^4c^3x^4+757a^2c^3x^2-2161c^3\right)\arcsin(ax)^2\right)\sqrt{-a^2x^2+1}}{13505625a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/13505625*(385875*(5*a^7*c^3*x^7 - 21*a^5*c^3*x^5 + 35*a^3*c^3*x^3 - 35*a
*c^3*x)*arcsin(a*x)^3 - 210*(1125*a^7*c^3*x^7 - 7371*a^5*c^3*x^5 + 26495*a^
3*c^3*x^3 - 226905*a*c^3*x)*arcsin(a*x) - (33750*a^6*c^3*x^6 - 269082*a^4*c
```

```
^3*x^4 + 1495874*a^2*c^3*x^2 - 44658302*c^3 - 11025*(75*a^6*c^3*x^6 - 351*a
^4*c^3*x^4 + 757*a^2*c^3*x^2 - 2161*c^3)*arcsin(a*x)^2)*sqrt(-a^2*x^2 + 1))
/a
```

Sympy [A]
time = 1.57, size = 355, normalized size = 0.96

$$\begin{cases} -\frac{a^6c^3x^7\operatorname{asin}^3(ax)}{7} + \frac{6a^6c^3x^7\operatorname{asin}(ax)}{343} - \frac{3a^5c^3x^6\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{49} + \frac{6a^5c^3x^6\sqrt{-a^2x^2+1}}{2401} + \frac{3a^4c^3x^5\operatorname{asin}^3(ax)}{5} - \frac{702a^4c^3x^5\operatorname{asin}(ax)}{6125} + \frac{351a^3c^3x^4\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{1225} - \frac{29898a^3c^3x^4\sqrt{-a^2x^2+1}}{1500625} - a^2c^3x^3\operatorname{asin}^3(ax) + \frac{1514a^2c^3x^3\operatorname{asin}(ax)}{3675} - \frac{757ac^3x^2\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{1225} + \frac{1495874ac^3x^2\sqrt{-a^2x^2+1}}{13505625} + c^3x\operatorname{asin}^3(ax) - \frac{4322c^3x\operatorname{asin}(ax)}{1225} + \frac{2161c^3\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{1225a} - \frac{44658302c^3\sqrt{-a^2x^2+1}}{13505625a} & \text{for}\: a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**3*asin(a*x)**3,x)
```

```
[Out] Piecewise((-a**6*c**3*x**7*asin(a*x)**3/7 + 6*a**6*c**3*x**7*asin(a*x)/343
- 3*a**5*c**3*x**6*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/49 + 6*a**5*c**3*x**6*
sqrt(-a**2*x**2 + 1)/2401 + 3*a**4*c**3*x**5*asin(a*x)**3/5 - 702*a**4*c**3
*x**5*asin(a*x)/6125 + 351*a**3*c**3*x**4*sqrt(-a**2*x**2 + 1)*asin(a*x)**2
/1225 - 29898*a**3*c**3*x**4*sqrt(-a**2*x**2 + 1)/1500625 - a**2*c**3*x**3*
asin(a*x)**3 + 1514*a**2*c**3*x**3*asin(a*x)/3675 - 757*a*c**3*x**2*sqrt(-a
**2*x**2 + 1)*asin(a*x)**2/1225 + 1495874*a*c**3*x**2*sqrt(-a**2*x**2 + 1)/
13505625 + c**3*x*asin(a*x)**3 - 4322*c**3*x*asin(a*x)/1225 + 2161*c**3*sqr
t(-a**2*x**2 + 1)*asin(a*x)**2/(1225*a) - 44658302*c**3*sqrt(-a**2*x**2 + 1
)/(13505625*a), Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.46, size = 379, normalized size = 1.02

$$-\frac{1}{7}\left(a^2x^2-1\right)^3c^3x\arcsin\left(ax\right)^3 + \frac{6}{35}\left(a^2x^2-1\right)^2c^3x\arcsin\left(ax\right)^3 + \frac{6}{343}\left(a^2x^2-1\right)^3c^3x\arcsin\left(ax\right) - \frac{8}{35}\left(a^2x^2-1\right)c^3x\arcsin\left(ax\right)^3 - \frac{3\left(a^2x^2-1\right)^3\sqrt{-a^2x^2+1}\,c^3\arcsin\left(ax\right)^2}{49a} - \frac{2664}{42875}\left(a^2x^2-1\right)^2c^3x\arcsin\left(ax\right) + \frac{16}{35}c^3x\arcsin\left(ax\right)^3 + \frac{18\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}\,c^3\arcsin\left(ax\right)^2}{175a} + \frac{30256}{128625}\left(a^2x^2-1\right)c^3x\arcsin\left(ax\right) + \frac{6\left(a^2x^2-1\right)^3\sqrt{-a^2x^2+1}\,c^3}{2401a} + \frac{8\left(-a^2x^2+1\right)^{\frac{3}{2}}c^3\arcsin\left(ax\right)^2}{35a} - \frac{413312}{128625}c^3x\arcsin\left(ax\right) - \frac{2664\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}\,c^3}{214375a} + \frac{48\sqrt{-a^2x^2+1}\,c^3\arcsin\left(ax\right)^2}{35a} - \frac{30256\left(-a^2x^2+1\right)^{\frac{3}{2}}c^3}{385875a} - \frac{413312\sqrt{-a^2x^2+1}\,c^3}{128625a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] -1/7*(a^2*x^2 - 1)^3*c^3*x*arcsin(a*x)^3 + 6/35*(a^2*x^2 - 1)^2*c^3*x*arcsi
n(a*x)^3 + 6/343*(a^2*x^2 - 1)^3*c^3*x*arcsin(a*x) - 8/35*(a^2*x^2 - 1)*c^3
*x*arcsin(a*x)^3 - 3/49*(a^2*x^2 - 1)^3*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^
2/a - 2664/42875*(a^2*x^2 - 1)^2*c^3*x*arcsin(a*x) + 16/35*c^3*x*arcsin(a*x
)^3 + 18/175*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^2/a + 30256
/128625*(a^2*x^2 - 1)*c^3*x*arcsin(a*x) + 6/2401*(a^2*x^2 - 1)^3*sqrt(-a^2*
x^2 + 1)*c^3/a + 8/35*(-a^2*x^2 + 1)^(3/2)*c^3*arcsin(a*x)^2/a - 413312/128
625*c^3*x*arcsin(a*x) - 2664/214375*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^3/
a + 48/35*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^2/a - 30256/385875*(-a^2*x^2 +
 1)^(3/2)*c^3/a - 413312/128625*sqrt(-a^2*x^2 + 1)*c^3/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \operatorname{asin}(a\,x)^3\,{\left(c-a^2\,c\,x^2\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^3,x)
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^3, x)
```

3.290 $\int \left(c-a^2 c x^2\right)^2 \text{ArcSin}(ax)^3 \, dx$

Optimal. Leaf size=273

$$-\frac{4144c^2\sqrt{1-a^2x^2}}{1125a}-\frac{272c^2(1-a^2x^2)^{3/2}}{3375a}-\frac{6c^2(1-a^2x^2)^{5/2}}{625a}-\frac{298}{75}c^2x\text{ArcSin}(ax)+\frac{76}{225}a^2c^2x^3\text{ArcSin}(ax)-$$

```
[Out] -272/3375*c^2*(-a^2*x^2+1)^(3/2)/a-6/625*c^2*(-a^2*x^2+1)^(5/2)/a-298/75*c^
2*x*arcsin(a*x)+76/225*a^2*c^2*x^3*arcsin(a*x)-6/125*a^4*c^2*x^5*arcsin(a*x
)+4/15*c^2*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2/a+3/25*c^2*(-a^2*x^2+1)^(5/2)*a
rcsin(a*x)^2/a+8/15*c^2*x*arcsin(a*x)^3+4/15*c^2*x*(-a^2*x^2+1)*arcsin(a*x)
^3+1/5*c^2*x*(-a^2*x^2+1)^2*arcsin(a*x)^3-4144/1125*c^2*(-a^2*x^2+1)^(1/2)/
a+8/5*c^2*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a
```

Rubi [A]
time = 0.29, antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.550$, Rules used = {4743, 4715, 4767, 267, 4739, 455, 45, 200, 12, 1261, 712}

$$-\frac{6}{125}a^4c^2x^5\text{ArcSin}(ax)+\frac{76}{225}a^2c^2x^3\text{ArcSin}(ax)+\frac{1}{5}c^2x\left(1-a^2x^2\right)^2\text{ArcSin}(ax)^3+\frac{4}{15}c^2x\left(1-a^2x^2\right)\text{ArcSin}(ax)^3+\frac{3c^2(1-a^2x^2)^{5/2}\text{ArcSin}(ax)^2}{25a}+\frac{4c^2(1-a^2x^2)^{3/2}\text{ArcSin}(ax)^2}{15a}+\frac{8c^2\sqrt{1-a^2x^2}\text{ArcSin}(ax)^2}{5a}-\frac{6c^2(1-a^2x^2)^{5/2}}{625a}-\frac{272c^2(1-a^2x^2)^{3/2}}{3375a}-\frac{4144c^2\sqrt{1-a^2x^2}}{1125a}+\frac{8}{15}c^2x\text{ArcSin}(ax)^3-\frac{298}{75}c^2x\text{ArcSin}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^2*ArcSin[a*x]^3,x]
```

```
[Out] (-4144*c^2*Sqrt[1 - a^2*x^2])/(1125*a) - (272*c^2*(1 - a^2*x^2)^(3/2))/(337
5*a) - (6*c^2*(1 - a^2*x^2)^(5/2))/(625*a) - (298*c^2*x*ArcSin[a*x])/75 + (
76*a^2*c^2*x^3*ArcSin[a*x])/225 - (6*a^4*c^2*x^5*ArcSin[a*x])/125 + (8*c^2*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(5*a) + (4*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[
a*x]^2)/(15*a) + (3*c^2*(1 - a^2*x^2)^(5/2)*ArcSin[a*x]^2)/(25*a) + (8*c^2*
x*ArcSin[a*x]^3)/15 + (4*c^2*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/15 + (c^2*x*(1
- a^2*x^2)^2*ArcSin[a*x]^3)/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
```

```
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \left(c-a^2cx^2\right)^2\sin^{-1}(ax)^3\,dx &= \frac{1}{5}c^2x\left(1-a^2x^2\right)^2\sin^{-1}(ax)^3+\frac{1}{5}(4c)\int\left(c-a^2cx^2\right)\sin^{-1}(ax)^3\,dx-\frac{1}{5}(3ac^2\\
&= \frac{3c^2\left(1-a^2x^2\right)^{5/2}\sin^{-1}(ax)^2}{25a}+\frac{4}{15}c^2x\left(1-a^2x^2\right)\sin^{-1}(ax)^3+\frac{1}{5}c^2x\left(1-a^2x\right.\\
&= -\frac{6}{25}c^2x\sin^{-1}(ax)+\frac{4}{25}a^2c^2x^3\sin^{-1}(ax)-\frac{6}{125}a^4c^2x^5\sin^{-1}(ax)+\frac{4c^2(1-}{}\\
&= -\frac{58}{75}c^2x\sin^{-1}(ax)+\frac{76}{225}a^2c^2x^3\sin^{-1}(ax)-\frac{6}{125}a^4c^2x^5\sin^{-1}(ax)+\frac{8c^2\sqrt{1}}{}\\
&= -\frac{298}{75}c^2x\sin^{-1}(ax)+\frac{76}{225}a^2c^2x^3\sin^{-1}(ax)-\frac{6}{125}a^4c^2x^5\sin^{-1}(ax)+\frac{8c^2\sqrt{}}{}\\
&= -\frac{16c^2\sqrt{1-a^2x^2}}{5a}-\frac{298}{75}c^2x\sin^{-1}(ax)+\frac{76}{225}a^2c^2x^3\sin^{-1}(ax)-\frac{6}{125}a^4c^2x^5\\
&= -\frac{4144c^2\sqrt{1-a^2x^2}}{1125a}-\frac{272c^2\left(1-a^2x^2\right)^{3/2}}{3375a}-\frac{6c^2\left(1-a^2x^2\right)^{5/2}}{625a}-\frac{298}{75}c^2x\sin
\end{aligned}$$

Mathematica [A]
time = 0.08, size = 139, normalized size = 0.51

$$\frac{c^2\left(-2\sqrt{1-a^2x^2}\left(31841-842a^2x^2+81a^4x^4\right)-30ax\left(2235-190a^2x^2+27a^4x^4\right)\text{ArcSin}(ax)+225\sqrt{1-a^2x^2}\left(149-38a^2x^2+9a^4x^4\right)\text{ArcSin}(ax)^2+1125ax\left(15-10a^2x^2+3a^4x^4\right)\text{ArcSin}(ax)^3\right)}{16875a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^2*ArcSin[a*x]^3,x]
```

```
[Out] (c^2*(-2*Sqrt[1 - a^2*x^2]*(31841 - 842*a^2*x^2 + 81*a^4*x^4) - 30*a*x*(223
5 - 190*a^2*x^2 + 27*a^4*x^4)*ArcSin[a*x] + 225*Sqrt[1 - a^2*x^2]*(149 - 38
```

```
*a^2*x^2 + 9*a^4*x^4)*ArcSin[a*x]^2 + 1125*a*x*(15 - 10*a^2*x^2 + 3*a^4*x^4
)*ArcSin[a*x]^3))/(16875*a)
```

Maple [A]
time = 0.09, size = 206, normalized size = 0.75

method	result
derivativedivides	$\frac{c^2\left(3375a^5x^5\arcsin(ax)^3+2025\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^4x^4-11250a^3x^3\arcsin(ax)^3-810a^5x^5\arcsin(ax)-8550\,a\right.}{}$
default	$\frac{c^2\left(3375a^5x^5\arcsin(ax)^3+2025\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^4x^4-11250a^3x^3\arcsin(ax)^3-810a^5x^5\arcsin(ax)-8550\,a\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16875/a*c^2*(3375*a^5*x^5*arcsin(a*x)^3+2025*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)*a^4*x^4-11250*a^3*x^3*arcsin(a*x)^3-810*a^5*x^5*arcsin(a*x)-8550*arcsi
n(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x^2-162*a^4*x^4*(-a^2*x^2+1)^(1/2)+16875*a*
x*arcsin(a*x)^3+5700*a^3*x^3*arcsin(a*x)+33525*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)+1684*a^2*x^2*(-a^2*x^2+1)^(1/2)-67050*a*x*arcsin(a*x)-63682*(-a^2*x^2+
1)^(1/2))
```

Maxima [A]
time = 0.51, size = 216, normalized size = 0.79

$$\frac{1}{75}\left(9\sqrt{-a^2x^2+1}\,a^2c^2x^4-38\sqrt{-a^2x^2+1}\,c^2x^2+\frac{149\sqrt{-a^2x^2+1}\,c^2}{a^2}\right)a\arcsin(ax)^2+\frac{1}{15}\left(3a^4c^2x^5-10a^2c^2x^3+15c^2x\right)\arcsin(ax)^3-\frac{2}{16875}\left(81\sqrt{-a^2x^2+1}\,a^2c^2x^4-842\sqrt{-a^2x^2+1}\,c^2x^2+\frac{15\left(27a^4c^2x^5-190a^2c^2x^3+2235c^2x\right)\arcsin(ax)}{a}+\frac{31841\sqrt{-a^2x^2+1}\,c^2}{a^2}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/75*(9*sqrt(-a^2*x^2 + 1)*a^2*c^2*x^4 - 38*sqrt(-a^2*x^2 + 1)*c^2*x^2 + 14
9*sqrt(-a^2*x^2 + 1)*c^2/a^2)*a*arcsin(a*x)^2 + 1/15*(3*a^4*c^2*x^5 - 10*a^
2*c^2*x^3 + 15*c^2*x)*arcsin(a*x)^3 - 2/16875*(81*sqrt(-a^2*x^2 + 1)*a^2*c^
2*x^4 - 842*sqrt(-a^2*x^2 + 1)*c^2*x^2 + 15*(27*a^4*c^2*x^5 - 190*a^2*c^2*x
^3 + 2235*c^2*x)*arcsin(a*x)/a + 31841*sqrt(-a^2*x^2 + 1)*c^2/a^2)*a
```

Fricas [A]
time = 1.58, size = 158, normalized size = 0.58

$$\frac{1125\left(3a^5c^2x^5-10a^3c^2x^3+15ac^2x\right)\arcsin(ax)^3-30\left(27a^5c^2x^5-190a^3c^2x^3+2235ac^2x\right)\arcsin(ax)-\left(162a^4c^2x^4-1684a^2c^2x^2-225\left(9a^4c^2x^4-38a^2c^2x^2+149c^2\right)\arcsin(ax)^2+63682c^2\right)\sqrt{-a^2x^2+1}}{16875a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] 1/16875*(1125*(3*a^5*c^2*x^5 - 10*a^3*c^2*x^3 + 15*a*c^2*x)*arcsin(a*x)^3 -
 30*(27*a^5*c^2*x^5 - 190*a^3*c^2*x^3 + 2235*a*c^2*x)*arcsin(a*x) - (162*a^
```

```
4*c^2*x^4 - 1684*a^2*c^2*x^2 - 225*(9*a^4*c^2*x^4 - 38*a^2*c^2*x^2 + 149*c^
2)*arcsin(a*x)^2 + 63682*c^2)*sqrt(-a^2*x^2 + 1))/a
```

Sympy [A]
time = 0.79, size = 262, normalized size = 0.96

$$\begin{cases} \frac{a^4c^2x^5\operatorname{asin}^3(ax)}{5} - \frac{6a^4c^2x^5\operatorname{asin}(ax)}{125} + \frac{3a^3c^2x^4\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{25} - \frac{6a^3c^2x^4\sqrt{-a^2x^2+1}}{625} - \frac{2a^2c^2x^3\operatorname{asin}^3(ax)}{3} + \frac{76a^2c^2x^3\operatorname{asin}(ax)}{225} - \frac{38ac^2x^2\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{75} + \frac{1684ac^2x^2\sqrt{-a^2x^2+1}}{16875} + c^2x\operatorname{asin}^3(ax) - \frac{298c^2x\operatorname{asin}(ax)}{75} + \frac{149c^2\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{75a} - \frac{63682c^2\sqrt{-a^2x^2+1}}{16875a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**2*asin(a*x)**3,x)
```

```
[Out] Piecewise((a**4*c**2*x**5*asin(a*x)**3/5 - 6*a**4*c**2*x**5*asin(a*x)/125 +
 3*a**3*c**2*x**4*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/25 - 6*a**3*c**2*x**4*s
qrt(-a**2*x**2 + 1)/625 - 2*a**2*c**2*x**3*asin(a*x)**3/3 + 76*a**2*c**2*x*
*3*asin(a*x)/225 - 38*a*c**2*x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/75 + 16
84*a*c**2*x**2*sqrt(-a**2*x**2 + 1)/16875 + c**2*x*asin(a*x)**3 - 298*c**2*
x*asin(a*x)/75 + 149*c**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(75*a) - 63682*
c**2*sqrt(-a**2*x**2 + 1)/(16875*a), Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.44, size = 267, normalized size = 0.98

$$\frac{1}{5}\left(a^2x^2-1\right)^2c^2x\arcsin(ax)^3 - \frac{4}{15}\left(a^2x^2-1\right)c^2x\arcsin(ax)^3 - \frac{6}{125}\left(a^2x^2-1\right)^2c^2x\arcsin(ax) + \frac{8}{15}c^2x\arcsin(ax)^3 + \frac{3\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}\,c^2\arcsin(ax)^2}{25\,a} + \frac{272}{1125}\left(a^2x^2-1\right)c^2x\arcsin(ax) + \frac{4\left(-a^2x^2+1\right)^{\frac{3}{2}}c^2\arcsin(ax)^2}{15\,a} - \frac{4144}{1125}c^2x\arcsin(ax) - \frac{6\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}\,c^2}{625\,a} + \frac{8\sqrt{-a^2x^2+1}\,c^2\arcsin(ax)^2}{5\,a} - \frac{272\left(-a^2x^2+1\right)^{\frac{3}{2}}c^2}{3375\,a} - \frac{4144\sqrt{-a^2x^2+1}\,c^2}{1125\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] 1/5*(a^2*x^2 - 1)^2*c^2*x*arcsin(a*x)^3 - 4/15*(a^2*x^2 - 1)*c^2*x*arcsin(a
*x)^3 - 6/125*(a^2*x^2 - 1)^2*c^2*x*arcsin(a*x) + 8/15*c^2*x*arcsin(a*x)^3
+ 3/25*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^2*arcsin(a*x)^2/a + 272/1125*(a
^2*x^2 - 1)*c^2*x*arcsin(a*x) + 4/15*(-a^2*x^2 + 1)^(3/2)*c^2*arcsin(a*x)^2
/a - 4144/1125*c^2*x*arcsin(a*x) - 6/625*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)
*c^2/a + 8/5*sqrt(-a^2*x^2 + 1)*c^2*arcsin(a*x)^2/a - 272/3375*(-a^2*x^2 +
1)^(3/2)*c^2/a - 4144/1125*sqrt(-a^2*x^2 + 1)*c^2/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \operatorname{asin}(a\,x)^3\,{\left(c-a^2\,c\,x^2\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^2,x)
```

```
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^2, x)
```

3.291 $\int (c-a^2cx^2)\,\textbf{ArcSin}(ax)^3\,dx$

Optimal. Leaf size=158

$$-\frac{40c\sqrt{1-a^2x^2}}{9a}-\frac{2c(1-a^2x^2)^{3/2}}{27a}-\frac{14}{3}cx\text{ArcSin}(ax)+\frac{2}{9}a^2cx^3\text{ArcSin}(ax)+\frac{2c\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{a}+\frac{c(1-$$

```
[Out] -2/27*c*(-a^2*x^2+1)^(3/2)/a-14/3*c*x*arcsin(a*x)+2/9*a^2*c*x^3*arcsin(a*x)
+1/3*c*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2/a+2/3*c*x*arcsin(a*x)^3+1/3*c*x*(-a
^2*x^2+1)*arcsin(a*x)^3-40/9*c*(-a^2*x^2+1)^(1/2)/a+2*c*arcsin(a*x)^2*(-a^2
*x^2+1)^(1/2)/a
```

Rubi [A]
time = 0.15, antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {4743, 4715, 4767, 267, 4739, 455, 45}

$$\frac{2}{9}a^2cx^3\text{ArcSin}(ax)+\frac{1}{3}cx(1-a^2x^2)\,\text{ArcSin}(ax)^3+\frac{c(1-a^2x^2)^{3/2}\,\text{ArcSin}(ax)^2}{3a}+\frac{2c\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2}{a}-\frac{2c(1-a^2x^2)^{3/2}}{27a}-\frac{40c\sqrt{1-a^2x^2}}{9a}+\frac{2}{3}cx\text{ArcSin}(ax)^3-\frac{14}{3}cx\text{ArcSin}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)*ArcSin[a*x]^3,x]
```

```
[Out] (-40*c*Sqrt[1 - a^2*x^2])/(9*a) - (2*c*(1 - a^2*x^2)^(3/2))/(27*a) - (14*c*
x*ArcSin[a*x])/3 + (2*a^2*c*x^3*ArcSin[a*x])/9 + (2*c*Sqrt[1 - a^2*x^2]*Arc
Sin[a*x]^2)/a + (c*(1 - a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(3*a) + (2*c*x*ArcSin
[a*x]^3)/3 + (c*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/3
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int (c - a^2cx^2)\sin^{-1}(ax)^3\,dx = \frac{1}{3}cx(1-a^2x^2)\sin^{-1}(ax)^3 + \frac{1}{3}(2c)\int \sin^{-1}(ax)^3\,dx - (ac)\int x\sqrt{1-a^2x^2}\ \sin$$

$$= \frac{c(1-a^2x^2)^{3/2}\sin^{-1}(ax)^2}{3a} + \frac{2}{3}cx\sin^{-1}(ax)^3 + \frac{1}{3}cx(1-a^2x^2)\sin^{-1}(ax)^3 - \frac{1}{3}($$

$$= -\frac{2}{3}cx\sin^{-1}(ax) + \frac{2}{9}a^2cx^3\sin^{-1}(ax) + \frac{2c\sqrt{1-a^2x^2}\ \sin^{-1}(ax)^2}{a} + \frac{c(1-a^2x^2}{}$$

$$= -\frac{14}{3}cx\sin^{-1}(ax) + \frac{2}{9}a^2cx^3\sin^{-1}(ax) + \frac{2c\sqrt{1-a^2x^2}\ \sin^{-1}(ax)^2}{a} + \frac{c(1-a^2}{}$$

$$= -\frac{4c\sqrt{1-a^2x^2}}{a} - \frac{14}{3}cx\sin^{-1}(ax) + \frac{2}{9}a^2cx^3\sin^{-1}(ax) + \frac{2c\sqrt{1-a^2x^2}\ \sin^{-1}(}{a}$$

$$= -\frac{40c\sqrt{1-a^2x^2}}{9a} - \frac{2c(1-a^2x^2)^{3/2}}{27a} - \frac{14}{3}cx\sin^{-1}(ax) + \frac{2}{9}a^2cx^3\sin^{-1}(ax) +$$

Mathematica [A]
time = 0.06, size = 101, normalized size = 0.64

$$\frac{c\left(2\sqrt{1-a^2x^2}\,(-61+a^2x^2)+6ax(-21+a^2x^2)\,\mathrm{ArcSin}(ax)-9\sqrt{1-a^2x^2}\,(-7+a^2x^2)\,\mathrm{ArcSin}(ax)^2-9ax(-3+a^2x^2)\,\mathrm{ArcSin}(ax)^3\right)}{27a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)*ArcSin[a*x]^3,x]
```

```
[Out] (c*(2*Sqrt[1 - a^2*x^2]*(-61 + a^2*x^2) + 6*a*x*(-21 + a^2*x^2)*ArcSin[a*x]
 - 9*Sqrt[1 - a^2*x^2]*(-7 + a^2*x^2)*ArcSin[a*x]^2 - 9*a*x*(-3 + a^2*x^2)*
ArcSin[a*x]^3))/(27*a)
```

Maple [A]
time = 0.06, size = 132, normalized size = 0.84

method	result
derivativedivides	$-\frac{c\left(9a^3x^3\arcsin(ax)^3+9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-27ax\arcsin(ax)^3-6a^3x^3\arcsin(ax)-63\arcsin(ax)^2\sqrt{-\right.}{27a}$
default	$-\frac{c\left(9a^3x^3\arcsin(ax)^3+9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-27ax\arcsin(ax)^3-6a^3x^3\arcsin(ax)-63\arcsin(ax)^2\sqrt{-\right.}{27a}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/27/a*c*(9*a^3*x^3*arcsin(a*x)^3+9*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x
^2-27*a*x*arcsin(a*x)^3-6*a^3*x^3*arcsin(a*x)-63*arcsin(a*x)^2*(-a^2*x^2+1)
```

```
^(1/2)-2*a^2*x^2*(-a^2*x^2+1)^(1/2)+126*a*x*arcsin(a*x)+122*(-a^2*x^2+1)^(1
/2))
```

Maxima [A]
time = 0.49, size = 128, normalized size = 0.81

$$-\frac{1}{3}\left(\sqrt{-a^2x^2+1}\,cx^2-\frac{7\sqrt{-a^2x^2+1}\,c}{a^2}\right)a\arcsin(ax)^2-\frac{1}{3}\left(a^2cx^3-3\,cx\right)\arcsin(ax)^3+\frac{2}{27}\left(\sqrt{-a^2x^2+1}\,cx^2+\frac{3\left(a^2cx^3-21\,cx\right)\arcsin(ax)}{a}-\frac{61\sqrt{-a^2x^2+1}\,c}{a^2}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*c*x^2 - 7*sqrt(-a^2*x^2 + 1)*c/a^2)*a*arcsin(a*x)^
2 - 1/3*(a^2*c*x^3 - 3*c*x)*arcsin(a*x)^3 + 2/27*(sqrt(-a^2*x^2 + 1)*c*x^2
+ 3*(a^2*c*x^3 - 21*c*x)*arcsin(a*x)/a - 61*sqrt(-a^2*x^2 + 1)*c/a^2)*a
```

Fricas [A]
time = 1.74, size = 95, normalized size = 0.60

$$-\frac{9\left(a^3cx^3-3\,acx\right)\arcsin(ax)^3-6\left(a^3cx^3-21\,acx\right)\arcsin(ax)-\left(2\,a^2cx^2-9\left(a^2cx^2-7\,c\right)\arcsin(ax)^2-122\,c\right)\sqrt{-a^2x^2+1}}{27\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/27*(9*(a^3*c*x^3 - 3*a*c*x)*arcsin(a*x)^3 - 6*(a^3*c*x^3 - 21*a*c*x)*arc
sin(a*x) - (2*a^2*c*x^2 - 9*(a^2*c*x^2 - 7*c)*arcsin(a*x)^2 - 122*c)*sqrt(-
a^2*x^2 + 1))/a
```

Sympy [A]
time = 0.34, size = 150, normalized size = 0.95

$$\begin{cases} -\frac{a^2cx^3\operatorname{asin}^3(ax)}{3}+\frac{2a^2cx^3\operatorname{asin}(ax)}{9}-\frac{acx^2\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{3}+\frac{2acx^2\sqrt{-a^2x^2+1}}{27}+cx\operatorname{asin}^3(ax)-\frac{14cx\operatorname{asin}(ax)}{3}+\frac{7c\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{3a}-\frac{122c\sqrt{-a^2x^2+1}}{27a} & \text{for}\ a\neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)*asin(a*x)**3,x)
```

```
[Out] Piecewise((-a**2*c*x**3*asin(a*x)**3/3 + 2*a**2*c*x**3*asin(a*x)/9 - a*c*x*
*2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/3 + 2*a*c*x**2*sqrt(-a**2*x**2 + 1)/27
 + c*x*asin(a*x)**3 - 14*c*x*asin(a*x)/3 + 7*c*sqrt(-a**2*x**2 + 1)*asin(a*
x)**2/(3*a) - 122*c*sqrt(-a**2*x**2 + 1)/(27*a), Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.44, size = 139, normalized size = 0.88

$$-\frac{1}{3}\left(a^2x^2-1\right)cx\arcsin(ax)^3+\frac{2}{3}\,cx\arcsin(ax)^3+\frac{2}{9}\left(a^2x^2-1\right)cx\arcsin(ax)+\frac{\left(-a^2x^2+1\right)^{\frac{3}{2}}c\arcsin(ax)^2}{3\,a}-\frac{40}{9}\,cx\arcsin(ax)+\frac{2\sqrt{-a^2x^2+1}\,c\arcsin(ax)^2}{a}-\frac{2\left(-a^2x^2+1\right)^{\frac{3}{2}}c}{27\,a}-\frac{40\sqrt{-a^2x^2+1}\,c}{9\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] -1/3*(a^2*x^2 - 1)*c*x*arcsin(a*x)^3 + 2/3*c*x*arcsin(a*x)^3 + 2/9*(a^2*x^2
 - 1)*c*x*arcsin(a*x) + 1/3*(-a^2*x^2 + 1)^(3/2)*c*arcsin(a*x)^2/a - 40/9*c
*x*arcsin(a*x) + 2*sqrt(-a^2*x^2 + 1)*c*arcsin(a*x)^2/a - 2/27*(-a^2*x^2 +
1)^(3/2)*c/a - 40/9*sqrt(-a^2*x^2 + 1)*c/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \operatorname{asin}(a\,x)^3\,\left(c-a^2\,c\,x^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2),x)
```

```
[Out] int(asin(a*x)^3*(c - a^2*c*x^2), x)
```

3.292 $\int \frac{\text{ArcSin}(ax)^3}{c-a^2cx^2}\,dx$

Optimal. Leaf size=200

$$-\frac{2i\text{ArcSin}(ax)^3\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{ac}+\frac{3i\text{ArcSin}(ax)^2\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(ax)}\right)}{ac}-\frac{3i\text{ArcSin}(ax)^2\text{PolyLog}(2,}{ac}$$

```
[Out] -2*I*arcsin(a*x)^3*arctan(I*a*x+(-a^2*x^2+1)^(1/2))/a/c+3*I*arcsin(a*x)^2*p
olylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c-3*I*arcsin(a*x)^2*polylog(2,I*(
I*a*x+(-a^2*x^2+1)^(1/2)))/a/c-6*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+
1)^(1/2)))/a/c+6*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c-6*
I*polylog(4,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c+6*I*polylog(4,I*(I*a*x+(-a^2
*x^2+1)^(1/2)))/a/c
```

Rubi [A]

time = 0.10, antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4749, 4266, 2611, 6744, 2320, 6724}

$$-\frac{2i\text{ArcSin}(ax)^3\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{ac}+\frac{3i\text{ArcSin}(ax)^2\text{Li}_2\left(-ie^{i\text{ArcSin}(ax)}\right)}{ac}-\frac{3i\text{ArcSin}(ax)^2\text{Li}_2\left(ie^{i\text{ArcSin}(ax)}\right)}{ac}-\frac{6\text{ArcSin}(ax)\text{Li}_3\left(-ie^{i\text{ArcSin}(ax)}\right)}{ac}+\frac{6\text{ArcSin}(ax)\text{Li}_3\left(ie^{i\text{ArcSin}(ax)}\right)}{ac}-\frac{6i\text{Li}_4\left(-ie^{i\text{ArcSin}(ax)}\right)}{ac}+\frac{6i\text{Li}_4\left(ie^{i\text{ArcSin}(ax)}\right)}{ac}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2),x]
```

```
[Out] ((-2*I)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c) + ((3*I)*ArcSin[a*x]
^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c) - ((3*I)*ArcSin[a*x]^2*PolyLog
[2, I*E^(I*ArcSin[a*x])])/(a*c) - (6*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSi
n[a*x])])/(a*c) + (6*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(a*c) - (
(6*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c) + ((6*I)*PolyLog[4, I*E^(I*
ArcSin[a*x])])/(a*c)
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
```

```
f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{c-a^2cx^2}\,dx = \frac{\text{Subst}\left(\int x^3\sec(x)\,dx, x, \sin^{-1}(ax)\right)}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3\text{Subst}\left(\int x^2\log\left(1-ie^{ix}\right)\,dx, x, \sin^{-1}(ax)\right)}{ac} + \frac{3\text{Su}}{}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2}{ac}$$

$$= -\frac{2i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac} + \frac{3i\sin^{-1}(ax)^2\text{Li}_2\left(-ie^{i\sin^{-1}(ax)}\right)}{ac} - \frac{3i\sin^{-1}(ax)^2\text{Li}_2}{ac}$$

Mathematica [A]
time = 0.13, size = 162, normalized size = 0.81

$$-\frac{i\left(2\text{ArcSin}(ax)^3\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right) - 3\text{ArcSin}(ax)^2\text{PolyLog}\left(2, -ie^{i\text{ArcSin}(ax)}\right) + 3\text{ArcSin}(ax)^2\text{PolyLog}\left(2, ie^{i\text{ArcSin}(ax)}\right) - 6i\text{ArcSin}(ax)\text{PolyLog}\left(3, -ie^{i\text{ArcSin}(ax)}\right) + 6i\text{ArcSin}(ax)\text{PolyLog}\left(3, ie^{i\text{ArcSin}(ax)}\right) + 6\text{PolyLog}\left(4, -ie^{i\text{ArcSin}(ax)}\right) - 6\text{PolyLog}\left(4, ie^{i\text{ArcSin}(ax)}\right)\right)}{ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2),x]
```

```
[Out] ((-I)*(2*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])] - 3*ArcSin[a*x]^2*PolyLog[
2, (-I)*E^(I*ArcSin[a*x])] + 3*ArcSin[a*x]^2*PolyLog[2, I*E^(I*ArcSin[a*x])
] - (6*I)*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])] + (6*I)*ArcSin[a*x
]*PolyLog[3, I*E^(I*ArcSin[a*x])] + 6*PolyLog[4, (-I)*E^(I*ArcSin[a*x])] -
6*PolyLog[4, I*E^(I*ArcSin[a*x])]))/(a*c)
```

Maple [F]
time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{\arcsin(ax)^3}{-a^2c\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c),x)
```

```
[Out] int(arcsin(a*x)^3/(-a^2*c*x^2+c),x)
```

Maxima [A]
time = 0.62, size = 36, normalized size = 0.18

$$\frac{1}{2}\left(\frac{\log\left(ax+1\right)}{ac}-\frac{\log\left(ax-1\right)}{ac}\right)\arcsin\left(ax\right)^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="maxima")
[Out] 1/2*(log(a*x + 1)/(a*c) - log(a*x - 1)/(a*c))*arcsin(a*x)^3
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="fricas")
[Out] integral(-arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{\operatorname{asin}^{3}\left(ax\right)}{a^{2}x^{2}-1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c),x)
[Out] -Integral(asin(a*x)**3/(a**2*x**2 - 1), x)/c
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="giac")
[Out] integrate(-arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{asin}(a\,x)^3}{c-a^2\,c\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2), x)
```

3.293 $\int \frac{\textbf{ArcSin}(ax)^3}{(c-a^2cx^2)^2}\,dx$

Optimal. Leaf size=337

$$-\frac{3\text{ArcSin}(ax)^2}{2ac^2\sqrt{1-a^2x^2}}+\frac{x\text{ArcSin}(ax)^3}{2c^2\left(1-a^2x^2\right)}-\frac{6i\text{ArcSin}(ax)\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{ac^2}-\frac{i\text{ArcSin}(ax)^3\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{ac^2}+$$

```
[Out] 1/2*x*arcsin(a*x)^3/c^2/(-a^2*x^2+1)-6*I*arcsin(a*x)*arctan(I*a*x+(-a^2*x^2
+1)^(1/2))/a/c^2-I*arcsin(a*x)^3*arctan(I*a*x+(-a^2*x^2+1)^(1/2))/a/c^2+3*I
*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2+3/2*I*arcsin(a*x)^2*polylog
(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2-3*I*polylog(2,I*(I*a*x+(-a^2*x^2+1)
^(1/2)))/a/c^2-3/2*I*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/
a/c^2-3*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2+3*arcsin
(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2-3*I*polylog(4,-I*(I*a*x
+(-a^2*x^2+1)^(1/2)))/a/c^2+3*I*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c
^2-3/2*arcsin(a*x)^2/a/c^2/(-a^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.22, antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4747, 4749, 4266, 2611, 6744, 2320, 6724, 4767, 2317, 2438}

$$\frac{x\text{ArcSin}(ax)^3}{2c^2\left(1-a^2x^2\right)}-\frac{3\text{ArcSin}(ax)^2}{2ac^2\sqrt{1-a^2x^2}}-\frac{i\text{ArcSin}(ax)^3\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{ac^2}-\frac{6i\text{ArcSin}(ax)\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{ac^2}+\frac{3i\text{ArcSin}(ax)^2\text{Li}_2\left(-ie^{i\text{ArcSin}(ax)}\right)}{2ac^2}-\frac{3i\text{ArcSin}(ax)^2\text{Li}_2\left(ie^{i\text{ArcSin}(ax)}\right)}{2ac^2}-\frac{3\text{ArcSin}(ax)\text{Li}_3\left(-ie^{i\text{ArcSin}(ax)}\right)}{ac^2}+\frac{3\text{ArcSin}(ax)\text{Li}_3\left(ie^{i\text{ArcSin}(ax)}\right)}{ac^2}+\frac{3i\text{Li}_2\left(-ie^{i\text{ArcSin}(ax)}\right)}{ac^2}-\frac{3i\text{Li}_2\left(ie^{i\text{ArcSin}(ax)}\right)}{ac^2}-\frac{3i\text{Li}_4\left(-ie^{i\text{ArcSin}(ax)}\right)}{ac^2}+\frac{3i\text{Li}_4\left(ie^{i\text{ArcSin}(ax)}\right)}{ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^2,x]
```

```
[Out] (-3*ArcSin[a*x]^2)/(2*a*c^2*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(2*c^2*(
1 - a^2*x^2)) - ((6*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) - (I*
ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) + ((3*I)*PolyLog[2, (-I)*E
^(I*ArcSin[a*x])])/(a*c^2) + (((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, (-I)*E^(I*
ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) -
(((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) - (3*ArcS
in[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])/(a*c^2) + (3*ArcSin[a*x]*PolyLo
g[3, I*E^(I*ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x
])])/(a*c^2) + ((3*I)*PolyLog[4, I*E^(I*ArcSin[a*x])])/(a*c^2)
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^2}\,dx = \frac{x\sin^{-1}(ax)^3}{2c^2\left(1-a^2x^2\right)} - \frac{(3a)\int \frac{x\sin^{-1}(ax)^2}{\left(1-a^2x^2\right)^{3/2}}\,dx}{2c^2} + \frac{\int \frac{\sin^{-1}(ax)^3}{c-a^2cx^2}\,dx}{2c}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2\left(1-a^2x^2\right)} + \frac{3\int \frac{\sin^{-1}(ax)}{1-a^2x^2}\,dx}{c^2} + \frac{\text{Subst}\left(\int x^3\sec(x)\,dx, x, \sin^{-1}\right.}{2ac^2}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2\left(1-a^2x^2\right)} - \frac{i\sin^{-1}(ax)^3\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{3\text{Subst}\left(\int x^2\right.}{}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2\left(1-a^2x^2\right)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\,t}{}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2\left(1-a^2x^2\right)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\,t}{}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2\left(1-a^2x^2\right)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\,t}{}$$

$$= -\frac{3\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{2c^2\left(1-a^2x^2\right)} - \frac{6i\sin^{-1}(ax)\tan^{-1}\left(e^{i\sin^{-1}(ax)}\right)}{ac^2} - \frac{i\sin^{-1}(ax)^3\,t}{}$$

Mathematica [A]

time = 0.19, size = 234, normalized size = 0.69

$$\frac{-\frac{3\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}} + \frac{ax\text{ArcSin}(ax)^3}{1-a^2x^2} - 12i\text{ArcSin}(ax)\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right) - 2i\text{ArcSin}(ax)^3\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right) + 3i\left(2+\text{ArcSin}(ax)^2\right)\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(ax)}\right) - 3i\left(2+\text{ArcSin}(ax)^2\right)\text{PolyLog}\left(2,ie^{i\text{ArcSin}(ax)}\right) - 6\text{ArcSin}(ax)\text{PolyLog}\left(3,-ie^{i\text{ArcSin}(ax)}\right) + 6\text{ArcSin}(ax)\text{PolyLog}\left(3,ie^{i\text{ArcSin}(ax)}\right) - 6i\text{PolyLog}\left(4,-ie^{i\text{ArcSin}(ax)}\right) + 6i\text{PolyLog}\left(4,ie^{i\text{ArcSin}(ax)}\right)}{2ac^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^2,x]
```

```
[Out] ((-3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2] + (a*x*ArcSin[a*x]^3)/(1 - a^2*x^2) -
 (12*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])] - (2*I)*ArcSin[a*x]^3*ArcTan[
E^(I*ArcSin[a*x])] + (3*I)*(2 + ArcSin[a*x]^2)*PolyLog[2, (-I)*E^(I*ArcSin[
a*x])] - (3*I)*(2 + ArcSin[a*x]^2)*PolyLog[2, I*E^(I*ArcSin[a*x])] - 6*ArcS
in[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])] + 6*ArcSin[a*x]*PolyLog[3, I*E^(
I*ArcSin[a*x])] - (6*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])] + (6*I)*PolyLog[
4, I*E^(I*ArcSin[a*x])])/(2*a*c^2)
```

Maple [A]
time = 0.29, size = 438, normalized size = 1.30

method	result
derivativedivides	$-\frac{\arcsin(ax)^2\left(ax\arcsin(ax)-3\sqrt{-a^2x^2+1}\right)}{2\left(a^2x^2-1\right)c^2}+\frac{\arcsin(ax)^3\ln\left(1-i\left(iax+\sqrt{-a^2x^2+1}\right)\right)}{2c^2}-\frac{3i\arcsin(ax)^2\operatorname{polylog}\left(2,i\right.}{}$
default	$-\frac{\arcsin(ax)^2\left(ax\arcsin(ax)-3\sqrt{-a^2x^2+1}\right)}{2\left(a^2x^2-1\right)c^2}+\frac{\arcsin(ax)^3\ln\left(1-i\left(iax+\sqrt{-a^2x^2+1}\right)\right)}{2c^2}-\frac{3i\arcsin(ax)^2\operatorname{polylog}\left(2,i\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/a*(-1/2/(a^2*x^2-1)*arcsin(a*x)^2*(a*x*arcsin(a*x)-3*(-a^2*x^2+1)^(1/2))/
c^2+1/2/c^2*arcsin(a*x)^3*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3/2*I/c^2*arcs
in(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3/c^2*arcsin(a*x)*polylog
(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3*I/c^2*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1
/2)))-1/2/c^2*arcsin(a*x)^3*ln(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3/2*I/c^2*ar
csin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3/c^2*arcsin(a*x)*poly
log(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3*I/c^2*polylog(4,-I*(I*a*x+(-a^2*x^2+
1)^(1/2)))-3/c^2*arcsin(a*x)*ln(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3/c^2*arcsi
n(a*x)*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3*I/c^2*dilog(1+I*(I*a*x+(-a^2*x^
2+1)^(1/2)))-3*I/c^2*dilog(1-I*(I*a*x+(-a^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.70, size = 57, normalized size = 0.17

$$-\frac{1}{4}\left(\frac{2\,x}{a^2c^2x^2-c^2}-\frac{\log\left(ax+1\right)}{ac^2}+\frac{\log\left(ax-1\right)}{ac^2}\right)\arcsin\left(ax\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] -1/4*(2*x/(a^2*c^2*x^2 - c^2) - log(a*x + 1)/(a*c^2) + log(a*x - 1)/(a*c^2)
)*arcsin(a*x)^3
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arcsin(a*x)^3/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{asin}^{3}(ax)}{a^{4}x^{4}-2a^{2}x^{2}+1}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(asin(a*x)**3/(a**4*x**4 - 2*a**2*x**2 + 1), x)/c**2
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(a^2*c*x^2 - c)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{asin}(a\,x)^3}{{(c-a^2\,c\,x^2)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^2,x)
```

```
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^2, x)
```

3.294 $\int \frac{\text{ArcSin}(ax)^3}{(c-a^2cx^2)^3}\,dx$

Optimal. Leaf size=455

$$-\frac{1}{4ac^3\sqrt{1-a^2x^2}}+\frac{x\text{ArcSin}(ax)}{4c^3(1-a^2x^2)}-\frac{\text{ArcSin}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}}-\frac{9\text{ArcSin}(ax)^2}{8ac^3\sqrt{1-a^2x^2}}+\frac{x\text{ArcSin}(ax)^3}{4c^3(1-a^2x^2)^2}+\frac{3x\text{ArcSin}(ax)^3}{8c^3(1-a^2x^2)}-$$

```
[Out] 1/4*x*arcsin(a*x)/c^3/(-a^2*x^2+1)-1/4*arcsin(a*x)^2/a/c^3/(-a^2*x^2+1)^(3/
2)+1/4*x*arcsin(a*x)^3/c^3/(-a^2*x^2+1)^2+3/8*x*arcsin(a*x)^3/c^3/(-a^2*x^2
+1)-9/8*I*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3-5/2*I
*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3-3/4*I*arcsin(a*x)^3*arctan(I
*a*x+(-a^2*x^2+1)^(1/2))/a/c^3-9/4*I*polylog(4,-I*(I*a*x+(-a^2*x^2+1)^(1/2)
))/a/c^3+9/8*I*arcsin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3
-5*I*arcsin(a*x)*arctan(I*a*x+(-a^2*x^2+1)^(1/2))/a/c^3-9/4*arcsin(a*x)*pol
ylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3+9/4*arcsin(a*x)*polylog(3,I*(I*
a*x+(-a^2*x^2+1)^(1/2)))/a/c^3+5/2*I*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)
))/a/c^3+9/4*I*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3-1/4/a/c^3/(-a^
2*x^2+1)^(1/2)-9/8*arcsin(a*x)^2/a/c^3/(-a^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.36, antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.550$, Rules used = {4747, 4749, 4266, 2611, 6744, 2320, 6724, 4767, 2317, 2438, 267}

$$\frac{3x\text{ArcSin}(ax)^3}{8c^3(1-a^2x^2)}+\frac{x\text{ArcSin}(ax)^3}{4c^3(1-a^2x^2)^2}-\frac{9\text{ArcSin}(ax)^2}{8ac^3\sqrt{1-a^2x^2}}-\frac{\text{ArcSin}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}}+\frac{x\text{ArcSin}(ax)}{4c^3(1-a^2x^2)}-\frac{1}{4ac^3\sqrt{1-a^2x^2}}-\frac{3i\text{ArcSin}(ax)^3\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{4ac^3}-\frac{5i\text{ArcSin}(ax)\text{ArcTan}\left(e^{i\text{ArcSin}(ax)}\right)}{ac^3}+\frac{9i\text{ArcSin}(ax)^2\text{Li}_2\left(-ie^{i\text{ArcSin}(ax)}\right)}{8ac^3}-\frac{9i\text{ArcSin}(ax)^2\text{Li}_2\left(ie^{i\text{ArcSin}(ax)}\right)}{8ac^3}-\frac{9\text{ArcSin}(ax)\text{Li}_3\left(-ie^{i\text{ArcSin}(ax)}\right)}{4ac^3}+\frac{9\text{ArcSin}(ax)\text{Li}_3\left(ie^{i\text{ArcSin}(ax)}\right)}{4ac^3}+\frac{5i\text{Li}_2\left(-ie^{i\text{ArcSin}(ax)}\right)}{2ac^3}-\frac{5i\text{Li}_2\left(ie^{i\text{ArcSin}(ax)}\right)}{2ac^3}-\frac{9i\text{Li}_4\left(-ie^{i\text{ArcSin}(ax)}\right)}{4ac^3}+\frac{9i\text{Li}_4\left(ie^{i\text{ArcSin}(ax)}\right)}{4ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^3,x]
```

```
[Out] -1/4*1/(a*c^3*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x])/(4*c^3*(1 - a^2*x^2)) -
ArcSin[a*x]^2/(4*a*c^3*(1 - a^2*x^2)^(3/2)) - (9*ArcSin[a*x]^2)/(8*a*c^3*Sq
rt[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(4*c^3*(1 - a^2*x^2)^2) + (3*x*ArcSin[
a*x]^3)/(8*c^3*(1 - a^2*x^2)) - ((5*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])
])/(a*c^3) - (((3*I)/4)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^3) +
(((5*I)/2)*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/8)*ArcSin[
a*x]^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) - (((5*I)/2)*PolyLog[2,
I*E^(I*ArcSin[a*x])])/(a*c^3) - (((9*I)/8)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*
ArcSin[a*x])])/(a*c^3) - (9*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])
/(4*a*c^3) + (9*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(4*a*c^3) - ((
(9*I)/4)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/4)*PolyLog[4
, I*E^(I*ArcSin[a*x])])/(a*c^3)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{(c-a^2cx^2)^3}\,dx = \frac{x\sin^{-1}(ax)^3}{4c^3(1-a^2x^2)^2} - \frac{(3a)\int \frac{x\sin^{-1}(ax)^2}{(1-a^2x^2)^{5/2}}\,dx}{4c^3} + \frac{3\int \frac{\sin^{-1}(ax)^3}{(c-a^2cx^2)^2}\,dx}{4c}$$

$$= -\frac{\sin^{-1}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} + \frac{x\sin^{-1}(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\sin^{-1}(ax)^3}{8c^3(1-a^2x^2)} + \frac{\int \frac{\sin^{-1}(ax)}{(1-a^2x^2)^2}\,dx}{2c^3} - \frac{(9a)\int \frac{x\sin}{(1-}}{8c}$$

$$= \frac{x\sin^{-1}(ax)}{4c^3(1-a^2x^2)} - \frac{\sin^{-1}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\sin^{-1}(}{8c^3(1-}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3(1-a^2x^2)} - \frac{\sin^{-1}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin}{4c^3(1}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3(1-a^2x^2)} - \frac{\sin^{-1}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin}{4c^3(1}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3(1-a^2x^2)} - \frac{\sin^{-1}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin}{4c^3(1}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3(1-a^2x^2)} - \frac{\sin^{-1}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin}{4c^3(1}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\sin^{-1}(ax)}{4c^3(1-a^2x^2)} - \frac{\sin^{-1}(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\sin^{-1}(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\sin}{4c^3(1}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1544 vs. $2(455) = 910$.
time = 12.12, size = 1544, normalized size = 3.39

Too large to display

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^3,x]
```

```
[Out] -(((1 + 5*ArcSin[a*x]^2)/4 - (5*(ArcSin[a*x]*(Log[1 - I*E^(I*ArcSin[a*x])]
- Log[1 + I*E^(I*ArcSin[a*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcSin[a*x])] - P
olyLog[2, I*E^(I*ArcSin[a*x])])))/2 - (3*((Pi^3*Log[Cot[(Pi/2 - ArcSin[a*x]
)/2]])/8 + (3*Pi^2*((Pi/2 - ArcSin[a*x])*(Log[1 - E^(I*(Pi/2 - ArcSin[a*x])
)] - Log[1 + E^(I*(Pi/2 - ArcSin[a*x]))]) + I*(PolyLog[2, -E^(I*(Pi/2 - Arc
Sin[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcSin[a*x]))])))/4 - (3*Pi*((Pi/2 -
ArcSin[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcSin[a*x]))] - Log[1 + E^(I*(Pi/2 -
ArcSin[a*x]))]) + (2*I)*(Pi/2 - ArcSin[a*x])*(PolyLog[2, -E^(I*(Pi/2 - ArcS
```

```
in[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcSin[a*x]))]) + 2*(-PolyLog[3, -E^(I
*(Pi/2 - ArcSin[a*x]))] + PolyLog[3, E^(I*(Pi/2 - ArcSin[a*x]))])))/2 + 8*(
(I/64)*(Pi/2 - ArcSin[a*x])^4 + (I/4)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)^4
- ((Pi/2 - ArcSin[a*x])^3*Log[1 + E^(I*(Pi/2 - ArcSin[a*x]))])/8 - (Pi^3*(I
*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2) - Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + A
rcSin[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)^3*Log[1 + E^((2*I
)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] + ((3*I)/8)*(Pi/2 - ArcSin[a*x])^2*P
olyLog[2, -E^(I*(Pi/2 - ArcSin[a*x]))] + (3*Pi^2*((I/2)*(Pi/2 + (-1/2*Pi +
ArcSin[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)*Log[1 + E^((2*I)*(Pi
/2 + (-1/2*Pi + ArcSin[a*x])/2))] + (I/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/
2*Pi + ArcSin[a*x])/2))]))/4 + ((3*I)/2)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)
^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] - (3*(Pi/2 - A
rcSin[a*x])*PolyLog[3, -E^(I*(Pi/2 - ArcSin[a*x]))])/4 - (3*Pi*((I/3)*(Pi/2
 + (-1/2*Pi + ArcSin[a*x])/2)^3 - (Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)^2*Log[
1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] + I*(Pi/2 + (-1/2*Pi + Ar
cSin[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] - P
olyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))]/2))/2 - (3*(Pi/2 +
 (-1/2*Pi + ArcSin[a*x])/2)*PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[
a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^(I*(Pi/2 - ArcSin[a*x]))] - ((3*I)/
4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))])))/8 - ArcSin[
a*x]^3/(16*(Cos[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/2])^4) - (2*ArcSin[a*x] -
ArcSin[a*x]^2 + 3*ArcSin[a*x]^3)/(16*(Cos[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/
2])^2) + (ArcSin[a*x]^2*Sin[ArcSin[a*x]/2])/(8*(Cos[ArcSin[a*x]/2] - Sin[Ar
cSin[a*x]/2])^3) + ArcSin[a*x]^3/(16*(Cos[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/
2])^4) - (ArcSin[a*x]^2*Sin[ArcSin[a*x]/2])/(8*(Cos[ArcSin[a*x]/2] + Sin[Ar
cSin[a*x]/2])^3) - (-2*ArcSin[a*x] - ArcSin[a*x]^2 - 3*ArcSin[a*x]^3)/(16*(
Cos[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/2])^2) - (-Sin[ArcSin[a*x]/2] - 5*ArcS
in[a*x]^2*Sin[ArcSin[a*x]/2])/(4*(Cos[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/2]))
 - (Sin[ArcSin[a*x]/2] + 5*ArcSin[a*x]^2*Sin[ArcSin[a*x]/2])/(4*(Cos[ArcSin
[a*x]/2] + Sin[ArcSin[a*x]/2])))/(a*c^3))
```

Maple [A]
time = 0.31, size = 543, normalized size = 1.19

method	result
derivativedivides	$-\frac{3a^3x^3\arcsin(ax)^3-9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-5ax\arcsin(ax)^3+2a^3x^3\arcsin(ax)+11\arcsin(ax)^2\sqrt{-a^2x^2+1}-}{8\left(a^4x^4-2a^2x^2+1\right)c^3}$
default	$-\frac{3a^3x^3\arcsin(ax)^3-9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-5ax\arcsin(ax)^3+2a^3x^3\arcsin(ax)+11\arcsin(ax)^2\sqrt{-a^2x^2+1}-}{8\left(a^4x^4-2a^2x^2+1\right)c^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/a*(-1/8*(3*a^3*x^3*arcsin(a*x)^3-9*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x
^2-5*a*x*arcsin(a*x)^3+2*a^3*x^3*arcsin(a*x)+11*arcsin(a*x)^2*(-a^2*x^2+1)^
(1/2)-2*a^2*x^2*(-a^2*x^2+1)^(1/2)-2*a*x*arcsin(a*x)+2*(-a^2*x^2+1)^(1/2))/
(a^4*x^4-2*a^2*x^2+1)/c^3+3/8/c^3*arcsin(a*x)^3*ln(1-I*(I*a*x+(-a^2*x^2+1)^
(1/2)))-9/8*I/c^3*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))+9/4
/c^3*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))+9/4*I/c^3*polylog(
4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3/8/c^3*arcsin(a*x)^3*ln(1+I*(I*a*x+(-a^2*x
^2+1)^(1/2)))+9/8*I/c^3*arcsin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2
)))-9/4/c^3*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-9/4*I/c^3*
polylog(4,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-5/2/c^3*arcsin(a*x)*ln(1+I*(I*a*x+
(-a^2*x^2+1)^(1/2)))+5/2/c^3*arcsin(a*x)*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))
+5/2*I/c^3*dilog(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))-5/2*I/c^3*dilog(1-I*(I*a*x
+(-a^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.83, size = 78, normalized size = 0.17

$$-\frac{1}{16}\left(\frac{2\,(3\,a^2x^3-5\,x)}{a^4c^3x^4-2\,a^2c^3x^2+c^3}-\frac{3\,\log\left(ax+1\right)}{ac^3}+\frac{3\,\log\left(ax-1\right)}{ac^3}\right)\arcsin\left(ax\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] -1/16*(2*(3*a^2*x^3 - 5*x)/(a^4*c^3*x^4 - 2*a^2*c^3*x^2 + c^3) - 3*log(a*x
+ 1)/(a*c^3) + 3*log(a*x - 1)/(a*c^3))*arcsin(a*x)^3
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(-arcsin(a*x)^3/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int\frac{\operatorname{asin}^{3}\left(ax\right)}{a^{6}x^{6}-3a^{4}x^{4}+3a^{2}x^{2}-1}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**3,x)
```

```
[Out] -Integral(asin(a*x)**3/(a**6*x**6 - 3*a**4*x**4 + 3*a**2*x**2 - 1), x)/c**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="giac")
[Out] integrate(-arcsin(a*x)^3/(a^2*c*x^2 - c)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{asin}(a\,x)^3}{{\left(c-a^2\,c\,x^2\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^3,x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^3, x)
```

3.295 $\int (c-a^2cx^2)^{5/2} \operatorname{ArcSin}(ax)^3 \, dx$

Optimal. Leaf size=533

$$\frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{245}{384}c^2x\sqrt{c-a^2cx^2}\operatorname{ArcSin}(ax$$

```
[Out] 5/24*c*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3+1/6*x*(-a^2*c*x^2+c)^(5/2)*arcs
in(a*x)^3-1/216*c^2*(-a^2*x^2+1)^(5/2)*(-a^2*c*x^2+c)^(1/2)/a-245/384*c^2*x
*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2)-65/576*c^2*x*(-a^2*x^2+1)*arcsin(a*x)*(-a
^2*c*x^2+c)^(1/2)-1/36*c^2*x*(-a^2*x^2+1)^2*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2
)+5/32*c^2*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a+1/12*c^2
*(-a^2*x^2+1)^(5/2)*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a+5/16*c^2*x*arcsin(
a*x)^3*(-a^2*c*x^2+c)^(1/2)+865/2304*a*c^2*x^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x
^2+1)^(1/2)-65/2304*a^3*c^2*x^4*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+115
/768*c^2*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-15/32*a*c^
2*x^2*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+5/64*c^2*arcsin
(a*x)^4*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.39, antiderivative size = 533, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.409$, Rules used = {4743, 4741, 4737, 4723, 4795, 30, 4767, 14, 267}

$$-\frac{15ac^2x^2\operatorname{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{32\sqrt{1-a^2x^2}}+\frac{5}{16}c^2x\operatorname{ArcSin}(ax)^3\sqrt{c-a^2cx^2}-\frac{245}{384}c^2x\operatorname{ArcSin}(ax)\sqrt{c-a^2cx^2}-\frac{1}{36}c^2x(1-a^2x^2)^2\operatorname{ArcSin}(ax)\sqrt{c-a^2cx^2}-\frac{65}{576}c^2x(1-a^2x^2)\operatorname{ArcSin}(ax)\sqrt{c-a^2cx^2}+\frac{5c^2\operatorname{ArcSin}(ax)^4\sqrt{c-a^2cx^2}}{64a\sqrt{1-a^2x^2}}+\frac{c^2(1-a^2x^2)^{5/2}\operatorname{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{12a}+\frac{5c^2(1-a^2x^2)^{3/2}\operatorname{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{32a}+\frac{115c^2\operatorname{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{768a\sqrt{1-a^2x^2}}+\frac{1}{6}x\operatorname{ArcSin}(ax)^3(c-a^2cx^2)^{5/2}+\frac{5}{24}cx\operatorname{ArcSin}(ax)^3(c-a^2cx^2)^{3/2}+\frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^3,x]
```

```
[Out] (865*a*c^2*x^2*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (65*a^3*c^2*
x^4*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (c^2*(1 - a^2*x^2)^(5/2
)*Sqrt[c - a^2*c*x^2])/(216*a) - (245*c^2*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]
)/384 - (65*c^2*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/576 - (c^2
*x*(1 - a^2*x^2)^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/36 + (115*c^2*Sqrt[c -
a^2*c*x^2]*ArcSin[a*x]^2)/(768*a*Sqrt[1 - a^2*x^2]) - (15*a*c^2*x^2*Sqrt[c
- a^2*c*x^2]*ArcSin[a*x]^2)/(32*Sqrt[1 - a^2*x^2]) + (5*c^2*(1 - a^2*x^2)^(
3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(32*a) + (c^2*(1 - a^2*x^2)^(5/2)*S
qrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(12*a) + (5*c^2*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x]^3)/16 + (5*c*x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/24 + (x*(c - a
^2*c*x^2)^(5/2)*ArcSin[a*x]^3)/6 + (5*c^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4
)/(64*a*Sqrt[1 - a^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^3\,dx = \frac{1}{6}x\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^3+\frac{1}{6}(5c)\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3\,dx - \ldots$$

$$= \frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^2}{12a}+\frac{5}{24}cx\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3 \ldots$$

$$= -\frac{1}{36}c^2x\left(1-a^2x^2\right)^2\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)+\frac{5c^2(1-a^2x^2)^{3/2}\sqrt{c-a^2cx \ldots}}{32a} \ldots$$

$$= -\frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{65}{576}c^2x\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sin^{-1}(ax \ldots$$

$$= -\frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}}{216a}-\frac{245}{384}c^2x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)-\frac{65}{576}c^2x \ldots$$

$$= \frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}-\frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a \ldots}}{216a} \ldots$$

Mathematica [A]
time = 0.56, size = 179, normalized size = 0.34

$$\frac{c^2\sqrt{c-a^2cx^2}\,(4320\text{ArcSin}(ax)^4-9720\cos(2\text{ArcSin}(ax))-243\cos(4\text{ArcSin}(ax))-8\cos(6\text{ArcSin}(ax))+72\text{ArcSin}(ax)^2(270\cos(2\text{ArcSin}(ax))+27\cos(4\text{ArcSin}(ax))+2\cos(6\text{ArcSin}(ax)))+288\text{ArcSin}(ax)^3(45\sin(2\text{ArcSin}(ax))+9\sin(4\text{ArcSin}(ax))+\sin(6\text{ArcSin}(ax)))-12\text{ArcSin}(ax)(1620\sin(2\text{ArcSin}(ax))+81\sin(4\text{ArcSin}(ax))+4\sin(6\text{ArcSin}(ax))))}{55296a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

[In] Integrate[(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^3,x]

[Out] (c^2*Sqrt[c - a^2*c*x^2]*(4320*ArcSin[a*x]^4 - 9720*Cos[2*ArcSin[a*x]] - 243*Cos[4*ArcSin[a*x]] - 8*Cos[6*ArcSin[a*x]] + 72*ArcSin[a*x]^2*(270*Cos[2*ArcSin[a*x]] + 27*Cos[4*ArcSin[a*x]] + 2*Cos[6*ArcSin[a*x]]) + 288*ArcSin[a*x]^3*(45*Sin[2*ArcSin[a*x]] + 9*Sin[4*ArcSin[a*x]] + Sin[6*ArcSin[a*x]]) - 12*ArcSin[a*x]*(1620*Sin[2*ArcSin[a*x]] + 81*Sin[4*ArcSin[a*x]] + 4*Sin[6*ArcSin[a*x]])))/(55296*a*Sqrt[1 - a^2*x^2])

Maple [C] Result contains complex when optimal does not.
time = 0.25, size = 699, normalized size = 1.31

method	result
default	$-\frac{5\sqrt{-c\left(a^2x^2-1\right)}\,\sqrt{-a^2x^2+1}\,\arcsin(ax)^4c^2}{64a\left(a^2x^2-1\right)}+\frac{\sqrt{-c\left(a^2x^2-1\right)}\,\left(-32i\sqrt{-a^2x^2+1}\,a^6x^6+32a^7x^7+48i\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)

[Out] -5/64*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4*c^2+1/13824*(-c*(a^2*x^2-1))^(1/2)*(-32*I*(-a^2*x^2+1)^(1/2)*a^6*x^6+32*a^7*x^7+48*I*(-a^2*x^2+1)^(1/2)*a^4*x^4-64*a^5*x^5-18*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+38*a^3*x^3+I*(-a^2*x^2+1)^(1/2)-6*a*x)*(18*I*arcsin(a*x)^2+36*arcsin(a*x)^3-I-6*arcsin(a*x))*c^2/a/(a^2*x^2-1)+15/512*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-I*(-a^2*x^2+1)^(1/2)-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3+3*I-6*arcsin(a*x))*c^2/a/(a^2*x^2-1)-1/110592*(-c*(a^2*x^2-1))^(1/2)*(I*a^2*x^2-a*x*(-a^2*x^2+1)^(1/2)-I)*(2088*I*arcsin(a*x)^2+2304*arcsin(a*x)^3-251*I-924*arcsin(a*x))*cos(5*arcsin(a*x))*c^2/a/(a^2*x^2-1)+5/110592*(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)*a*x+a^2*x^2-1)*(360*I*arcsin(a*x)^2+576*arcsin(a*x)^3-47*I-204*arcsin(a*x))*sin(5*arcsin(a*x))*c^2/a/(a^2*x^2-1)-3/4096*(-c*(a^2*x^2-1))^(1/2)*(I*a^2*x^2-a*x*(-a^2*x^2+1)^(1/2)-I)*(264*I*arcsin(a*x)^2+128*arcsin(a*x)^3-123*I-228*arcsin(a*x))*cos(3*arcsin(a*x))*c^2/a/(a^2*x^2-1)+9/4096*(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)*a*x+a^2*x^2-1)*(72*I*arcsin(a*x)^2+64*arcsin(a*x)^3-39*I-84*arcsin(a*x))*sin(3*arcsin(a*x))*c^2/a/(a^2*x^2-1)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="maxima")

[Out] integrate((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^3, x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*sqrt(-a^2*c*x^2 + c)*arcsin(a*
x)^3, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(5/2)*asin(a*x)**3,x)
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{asin}(a\,x)^3\,{\left(c-a^2\,c\,x^2\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^(5/2),x)
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^(5/2), x)
```

3.296 $\int (c-a^2cx^2)^{3/2} \text{ArcSin}(ax)^3 \, dx$

Optimal. Leaf size=365

$$\frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{45}{64}cx\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)-\frac{3}{32}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\text{ArcSi}$$

```
[Out] 1/4*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3-45/64*c*x*arcsin(a*x)*(-a^2*c*x^2+
c)^(1/2)-3/32*c*x*(-a^2*x^2+1)*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2)+3/16*c*(-a^
2*x^2+1)^(3/2)*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a+3/8*c*x*arcsin(a*x)^3*(
-a^2*c*x^2+c)^(1/2)+51/128*a*c*x^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)-
3/128*a^3*c*x^4*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+27/128*c*arcsin(a*x
)^2*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-9/16*a*c*x^2*arcsin(a*x)^2*(-
a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+3/32*c*arcsin(a*x)^4*(-a^2*c*x^2+c)^(
1/2)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.25, antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$, Rules used = {4743, 4741, 4737, 4723, 4795, 30, 4767, 14}

$$-\frac{9acx^2\text{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{16\sqrt{1-a^2x^2}}+\frac{1}{4}x\text{ArcSin}(ax)^3\left(c-a^2cx^2\right)^{3/2}+\frac{3}{8}cx\text{ArcSin}(ax)^3\sqrt{c-a^2cx^2}-\frac{45}{64}cx\text{ArcSin}(ax)\sqrt{c-a^2cx^2}-\frac{3}{32}cx\left(1-a^2x^2\right)\text{ArcSin}(ax)\sqrt{c-a^2cx^2}+\frac{3c\text{ArcSin}(ax)^4\sqrt{c-a^2cx^2}}{32a\sqrt{1-a^2x^2}}+\frac{3c\left(1-a^2x^2\right)^{3/2}\text{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{16a}+\frac{27c\text{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{128a\sqrt{1-a^2x^2}}+\frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3,x]
```

```
[Out] (51*a*c*x^2*Sqrt[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (3*a^3*c*x^4*Sqr
t[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (45*c*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x])/64 - (3*c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/32 + (
27*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(128*a*Sqrt[1 - a^2*x^2]) - (9*a*c*
x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*Sqrt[1 - a^2*x^2]) + (3*c*(1 - a
^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*a) + (3*c*x*Sqrt[c - a
^2*c*x^2]*ArcSin[a*x]^3)/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/4 + (3
*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4)/(32*a*Sqrt[1 - a^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
```

```
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3\,dx = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^3+\frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^3\,dx-\frac{\left(3ac\right.}{}$$

$$=\frac{3c\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^2}{16a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^3+\frac{1}{4}$$

$$=-\frac{3}{32}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)-\frac{9acx^2\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^2}{16\sqrt{1-a^2x^2}}-$$

$$=-\frac{45}{64}cx\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)-\frac{3}{32}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)-$$

$$=\frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{45}{64}cx\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)-$$

Mathematica [A]
time = 0.22, size = 138, normalized size = 0.38

$$\frac{c\sqrt{c-a^2cx^2}\,(96\mathrm{ArcSin}(ax)^4+24\mathrm{ArcSin}(ax)^2(16\cos(2\mathrm{ArcSin}(ax))+\cos(4\mathrm{ArcSin}(ax)))-3(64\cos(2\mathrm{ArcSin}(ax))+\cos(4\mathrm{ArcSin}(ax)))+32\mathrm{ArcSin}(ax)^3(8\sin(2\mathrm{ArcSin}(ax))+\sin(4\mathrm{ArcSin}(ax)))-12\mathrm{ArcSin}(ax)(32\sin(2\mathrm{ArcSin}(ax))+\sin(4\mathrm{ArcSin}(ax))))}{1024a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3,x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(96*ArcSin[a*x]^4 + 24*ArcSin[a*x]^2*(16*Cos[2*ArcSi
n[a*x]] + Cos[4*ArcSin[a*x]]) - 3*(64*Cos[2*ArcSin[a*x]] + Cos[4*ArcSin[a*x
]]) + 32*ArcSin[a*x]^3*(8*Sin[2*ArcSin[a*x]] + Sin[4*ArcSin[a*x]]) - 12*Arc
Sin[a*x]*(32*Sin[2*ArcSin[a*x]] + Sin[4*ArcSin[a*x]])))/(1024*a*Sqrt[1 - a^
2*x^2])
```

Maple [C] Result contains complex when optimal does not.
time = 0.18, size = 474, normalized size = 1.30

method	result

default	$-\frac{3\sqrt{-c\left(a^{2}x^{2}-1\right)}\,\sqrt{-a^{2}x^{2}+1}\,\arcsin\left(ax\right)^{4}c}{32a\left(a^{2}x^{2}-1\right)}-\frac{\sqrt{-c\left(a^{2}x^{2}-1\right)}\,\left(-8i\sqrt{-a^{2}x^{2}+1}\,a^{4}x^{4}+8a^{5}x^{5}+8i\sqrt{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -3/32*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4
*c-1/2048*(-c*(a^2*x^2-1))^(1/2)*(-8*I*(-a^2*x^2+1)^(1/2)*a^4*x^4+8*a^5*x^5
+8*I*(-a^2*x^2+1)^(1/2)*a^2*x^2-12*a^3*x^3-I*(-a^2*x^2+1)^(1/2)+4*a*x)*(24*
I*arcsin(a*x)^2+32*arcsin(a*x)^3-3*I-12*arcsin(a*x))*c/a/(a^2*x^2-1)+1/32*(
-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-I*(-a^2*x^2
+1)^(1/2)-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3+3*I-6*arcsin(a*x))*c/a
/(a^2*x^2-1)-1/2048*(-c*(a^2*x^2-1))^(1/2)*(I*a^2*x^2-a*x*(-a^2*x^2+1)^(1/2
)-I)*(408*I*arcsin(a*x)^2+224*arcsin(a*x)^3-195*I-372*arcsin(a*x))*cos(3*ar
csin(a*x))*c/a/(a^2*x^2-1)+9/2048*(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1
/2)*a*x+a^2*x^2-1)*(40*I*arcsin(a*x)^2+32*arcsin(a*x)^3-21*I-44*arcsin(a*x)
)*sin(3*arcsin(a*x))*c/a/(a^2*x^2-1)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c*x^2 - c)*sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\left(-c(ax-1)\,(ax+1)\right)^{\frac{3}{2}}\operatorname{asin}^{3}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**3,x)
```

```
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)*asin(a*x)**3, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{asin}(a\,x)^3\,{\left(c-a^2\,c\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^(3/2), x)
```

3.297 $\int \sqrt{c-a^2cx^2}\,\textbf{ArcSin}(ax)^3\,dx$

Optimal. Leaf size=215

$$\frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}-\frac{3}{4}x\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)+\frac{3\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^2}{8a\sqrt{1-a^2x^2}}-\frac{3ax^2\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^2}{4\sqrt{1-a^2x^2}}$$

```
[Out] -3/4*x*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2)+1/2*x*arcsin(a*x)^3*(-a^2*c*x^2+c)^
(1/2)+3/8*a*x^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+3/8*arcsin(a*x)^2*(
-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/4*a*x^2*arcsin(a*x)^2*(-a^2*c*x^
2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+1/8*arcsin(a*x)^4*(-a^2*c*x^2+c)^(1/2)/a/(-a^
2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.227$, Rules used = {4741, 4737, 4723, 4795, 30}

$$\frac{\text{ArcSin}(ax)^4\sqrt{c-a^2cx^2}}{8a\sqrt{1-a^2x^2}}+\frac{1}{2}x\text{ArcSin}(ax)^3\sqrt{c-a^2cx^2}-\frac{3ax^2\text{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{4\sqrt{1-a^2x^2}}+\frac{3\text{ArcSin}(ax)^2\sqrt{c-a^2cx^2}}{8a\sqrt{1-a^2x^2}}-\frac{3}{4}x\text{ArcSin}(ax)\sqrt{c-a^2cx^2}+\frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3,x]
```

```
[Out] (3*a*x^2*Sqrt[c - a^2*c*x^2])/(8*Sqrt[1 - a^2*x^2]) - (3*x*Sqrt[c - a^2*c*x
^2]*ArcSin[a*x])/4 + (3*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(8*a*Sqrt[1 - a^
2*x^2]) - (3*a*x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(4*Sqrt[1 - a^2*x^2])
 + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3)/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*
x]^4)/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^3\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^3+\frac{\sqrt{c-a^2cx^2}\int\frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}}-\frac{\left(3a\sqrt{c-a^2cx\right.}{2\sqrt{}}$$

$$=-\frac{3ax^2\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^2}{4\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^3+\frac{\sqrt{c-a^2cx^2}\,\mathrm{s}}{8a\sqrt{1-}}$$

$$=-\frac{3}{4}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)-\frac{3ax^2\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^2}{4\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}$$

$$=\frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}-\frac{3}{4}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)+\frac{3\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^2}{8a\sqrt{1-a^2x^2}}-$$

Mathematica [A]
time = 0.04, size = 114, normalized size = 0.53

$$\frac{\sqrt{c-a^2cx^2}\left(3a^2x^2-6ax\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)+(3-6a^2x^2)\,\mathrm{ArcSin}(ax)^2+4ax\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^3+\mathrm{ArcSin}(ax)^4\right)}{8a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3,x]

[Out] (Sqrt[c - a^2*c*x^2]*(3*a^2*x^2 - 6*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + (3 - 6*a^2*x^2)*ArcSin[a*x]^2 + 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + ArcSin[a*x]^4))/(8*a*Sqrt[1 - a^2*x^2])

Maple [C] Result contains complex when optimal does not.
time = 0.16, size = 260, normalized size = 1.21

method	result
default	$-\frac{\sqrt{-c\left(a^{2}x^{2}-1\right)}\,\sqrt{-a^{2}x^{2}+1}\,\arcsin(ax)^{4}}{8a\left(a^{2}x^{2}-1\right)}+\frac{\sqrt{-c\left(a^{2}x^{2}-1\right)}\,\left(-2i\sqrt{-a^{2}x^{2}+1}\,a^{2}x^{2}+2a^{3}x^{3}+i\sqrt{-a\right.}{32a(a^{2}}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)

[Out] -1/8*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4+1/32*(-c*(a^2*x^2-1))^(1/2)*(-2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3+I*(-a^2*x^2+1)^(1/2)-2*a*x)*(6*I*arcsin(a*x)^2+4*arcsin(a*x)^3-3*I-6*arcsin(a*x))/a/(a^2*x^2-1)+1/32*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-I*(-a^2*x^2+1)^(1/2)-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3+3*I-6*arcsin(a*x))/a/(a^2*x^2-1)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="maxima")

[Out] integrate(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="fricas")

[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{-c\left(ax-1\right)\left(ax+1\right)}\,\operatorname{asin}^{3}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**3,x)
```

```
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**3, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{asin}(a\,x)^3\,\sqrt{c-a^2\,c\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^(1/2),x)
```

```
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^(1/2), x)
```

3.298 $\int \frac{\text{ArcSin}(ax)^3}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=42

$$\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

```
[Out] 1/4*arcsin(a*x)^4*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.045$, Rules used = {4737}

$$\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^4)/(4*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^3}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^4}{4a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 42, normalized size = 1.00

$$\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/Sqrt[c - a^2*c*x^2],x]
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^4)/(4*a*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.09, size = 52, normalized size = 1.24

method	result	size
default	$-\frac{\sqrt{-c\left(a^{2} x^{2}-1\right)}\, \sqrt{-a^{2} x^{2}+1}\, \arcsin\left(a x\right)^{4}}{4 a c \left(a^{2} x^{2}-1\right)}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/4*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c/(a^2*x^2-1)*arcsin(a*x)^
4
```

Maxima [A]
time = 0.50, size = 14, normalized size = 0.33

$$\frac{\arcsin\left(ax\right)^4}{4\,a\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] 1/4*arcsin(a*x)^4/(a*sqrt(c))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{3}\left(ax\right)}{\sqrt{-c\left(ax-1\right)\left(ax+1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(1/2),x)
[Out] Integral(asin(a*x)**3/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{asin}(a\,x)^3}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(1/2), x)
```

3.299 $\int \frac{\mathbf{ArcSin}(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=238

$$\frac{x\text{ArcSin}(ax)^3}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{ac\sqrt{c-a^2cx^2}}+\frac{3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}-\frac{3i\sqrt{1-a^2x^2}\,\text{Arc}}{}$$

```
[Out] x*arcsin(a*x)^3/c/(-a^2*c*x^2+c)^(1/2)-I*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a
/c/(-a^2*c*x^2+c)^(1/2)+3*arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)*
(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)-3*I*arcsin(a*x)*polylog(2,-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)+3/2*p
olylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+
c)^(1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.318$, Rules used = {4745, 4765, 3800, 2221, 2611, 2320, 6724}

$$-\frac{3i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\text{Li}_2\left(-e^{2i\text{ArcSin}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}+\frac{3\sqrt{1-a^2x^2}\,\text{Li}_3\left(-e^{2i\text{ArcSin}(ax)}\right)}{2ac\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)^3}{c\sqrt{c-a^2cx^2}}-\frac{i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{ac\sqrt{c-a^2cx^2}}+\frac{3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^3)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^3)/(a*c*Sqrt[c - a^2*c*x^2]) + (3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 +
 E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - ((3*I)*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]
) + (3*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x])])/(2*a*c*Sqrt[c
- a^2*c*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx = \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{\left(3a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)^2}{1-a^2x^2}\,dx}{c\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{\left(3\sqrt{1-a^2x^2}\right)\operatorname{Subst}\left(\int x^2\tan(x)\,dx, x, \sin^{-1}(ax)\right)}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{\left(6i\sqrt{1-a^2x^2}\right)\operatorname{Subst}\left(\int \frac{e^{2ix}x^2}{1+e^{2ix}}\,dx, x, \sin\right.}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(a}\right.}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(a}\right.}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(a}\right.}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\sin^{-1}(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^2\log\left(1+e^{2i\sin^{-1}(a}\right.}{ac\sqrt{c-a^2cx^2}}$$

Mathematica [A]
time = 0.19, size = 157, normalized size = 0.66

$$\frac{2\text{ArcSin}(ax)^2\left(\left(ax-i\sqrt{1-a^2x^2}\right)\text{ArcSin}(ax)+3\sqrt{1-a^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(ax)}\right)\right)-6i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(ax)}\right)+3\sqrt{1-a^2x^2}\,\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(ax)}\right)}{2ac\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (2*ArcSin[a*x]^2*((a*x - I*Sqrt[1 - a^2*x^2])*ArcSin[a*x] + 3*Sqrt[1 - a^2*
x^2]*Log[1 + E^((2*I)*ArcSin[a*x])]) - (6*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*
PolyLog[2, -E^((2*I)*ArcSin[a*x])] + 3*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*
I)*ArcSin[a*x])])/(2*a*c*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.17, size = 203, normalized size = 0.85

method	result
default	$-\frac{\sqrt{-c\left(a^2x^2-1\right)}\left(i\sqrt{-a^2x^2+1}+ax\right)\arcsin(ax)^3}{a\,c^2\left(a^2x^2-1\right)}+\frac{\sqrt{-c\left(a^2x^2-1\right)}\,\sqrt{-a^2x^2+1}\,\left(4i\arcsin(ax)^3+6i\,a\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)+a*x)*arcsin(a*x)^3/a/c^2/(a^2
*x^2-1)+1/2*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)*(4*I*arcsin(a*x)^3+6*
I*arcsin(a*x)*polylog(2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-6*arcsin(a*x)^2*ln(1
+(I*a*x+(-a^2*x^2+1)^(1/2))^2)-3*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/
a/c^2/(a^2*x^2-1)
```

Maxima [A]
time = 0.92, size = 49, normalized size = 0.21

$$\frac{x\arcsin\left(ax\right)^{3}}{\sqrt{-a^{2}cx^{2}+c}\,c}-\frac{3\arcsin\left(ax\right)^{2}\log\left(x^{2}-\frac{1}{a^{2}}\right)}{2\,ac^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] x*arcsin(a*x)^3/(sqrt(-a^2*c*x^2 + c)*c) - 3/2*arcsin(a*x)^2*log(x^2 - 1/a^
2)/(a*c^(3/2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 +
c^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\operatorname{asin}^{3}\left(ax\right)}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{asin}(a\,x)^3}{{\left(c-a^2\,c\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(3/2), x)
```

3.300 $\int \frac{\text{ArcSin}(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=388

$$\frac{x\text{ArcSin}(ax)}{c^2\sqrt{c-a^2cx^2}}-\frac{\text{ArcSin}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)^3}{3c(c-a^2cx^2)^{3/2}}+\frac{2x\text{ArcSin}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}-\frac{2i\sqrt{1-a^2x^2}\,\text{ArcSin}(a}{3ac^2\sqrt{c-a^2cx^2}}$$

```
[Out] 1/3*x*arcsin(a*x)^3/c/(-a^2*c*x^2+c)^(3/2)+x*arcsin(a*x)/c^2/(-a^2*c*x^2+c)
^(1/2)+2/3*x*arcsin(a*x)^3/c^2/(-a^2*c*x^2+c)^(1/2)-1/2*arcsin(a*x)^2/a/c^2
/(-a^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-2/3*I*arcsin(a*x)^3*(-a^2*x^2+1)^(
1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)+2*arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1
/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)+1/2*ln(-a^2*x^2+1)*(-
a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)-2*I*arcsin(a*x)*polylog(2,-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)+pol
ylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+
c)^(1/2)
```

Rubi [A]
time = 0.22, antiderivative size = 388, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.454$, Rules used = {4747, 4745, 4765, 3800, 2221, 2611, 2320, 6724, 4767, 266}

$$-\frac{2i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\text{Li}_2\left(-e^{2i\text{ArcSin}(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\,\text{Li}_3\left(-e^{2i\text{ArcSin}(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}+\frac{2x\text{ArcSin}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}-\frac{2i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{3ac^2\sqrt{c-a^2cx^2}}-\frac{\text{ArcSin}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)}{c^2\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)^3}{3c(c-a^2cx^2)^{3/2}}+\frac{\sqrt{1-a^2x^2}\,\log(1-a^2x^2)}{2ac^2\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (x*ArcSin[a*x])/(c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]^2/(2*a*c^2*Sqrt[1 -
 a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]^3)/(3*c*(c - a^2*c*x^2)^(3/
2)) + (2*x*ArcSin[a*x]^3)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]^3)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*x^2])
+ (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^2*Sqrt[c - a^2*c*x^2]) - ((2*
I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2
*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x]
)])/(a*c^2*Sqrt[c - a^2*c*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{5/2}}\,dx = \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2\int \frac{\sin^{-1}(ax)^3}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{3c} - \frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)^2}{\left(1-a^2x^2\right)^2}\,dx}{c^2\sqrt{c-a^2cx^2}}$$

$$= -\frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\cdots}{c^2\sqrt{c\cdots}}$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\cdots$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\cdots$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\cdots$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\cdots$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\cdots$$

$$= \frac{x\sin^{-1}(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\sin^{-1}(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\sin^{-1}(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\cdots$$

Mathematica [A]
time = 0.42, size = 211, normalized size = 0.54

$$\frac{(1-a^2x^2)^{3/2}\left(\frac{6ax\text{ArcSin}(ax)}{\sqrt{1-a^2x^2}}+\frac{3\text{ArcSin}(ax)^2}{-1+a^2x^2}-4i\text{ArcSin}(ax)^3+\frac{2ax\text{ArcSin}(ax)^3}{(1-a^2x^2)^{3/2}}+\frac{4ax\text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}+12\text{ArcSin}(ax)^2\log\left(1+e^{2i\text{ArcSin}(ax)}\right)+3\log\left(1-a^2x^2\right)-12i\text{ArcSin}(ax)\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(ax)}\right)+6\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(ax)}\right)\right)}{6ac\left(c-a^2cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] ((1 - a^2*x^2)^(3/2)*((6*a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2] + (3*ArcSin[a*x
]^2)/(-1 + a^2*x^2) - (4*I)*ArcSin[a*x]^3 + (2*a*x*ArcSin[a*x]^3)/(1 - a^2*
x^2)^(3/2) + (4*a*x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2] + 12*ArcSin[a*x]^2*Log
[1 + E^((2*I)*ArcSin[a*x])] + 3*Log[1 - a^2*x^2] - (12*I)*ArcSin[a*x]*PolyL
og[2, -E^((2*I)*ArcSin[a*x])] + 6*PolyLog[3, -E^((2*I)*ArcSin[a*x])]))/(6*a
*c*(c - a^2*c*x^2)^(3/2))
```

Maple [A]
time = 0.24, size = 661, normalized size = 1.70

method	result
default	$-\frac{\sqrt{-c\left(a^2x^2-1\right)}\left(2i\sqrt{-a^2x^2+1}\,a^2x^2+2a^3x^3-2i\sqrt{-a^2x^2+1}-3ax\right)\arcsin(ax)\left(-6i\arcsin(ax)a^4x^4-6\arcsin(\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-2*I*(
-a^2*x^2+1)^(1/2)-3*a*x)*arcsin(a*x)*(-6*I*arcsin(a*x)*a^4*x^4-6*arcsin(a*x
)*(-a^2*x^2+1)^(1/2)*a^3*x^3+6*I*(-a^2*x^2+1)^(1/2)*a^3*x^3-6*a^4*x^4+6*arc
sin(a*x)^2*a^2*x^2+12*I*arcsin(a*x)*a^2*x^2+9*a*x*arcsin(a*x)*(-a^2*x^2+1)^
(1/2)-6*I*(-a^2*x^2+1)^(1/2)*a*x+18*a^2*x^2-8*arcsin(a*x)^2-6*I*arcsin(a*x)
-12)/c^3/(3*a^6*x^6-10*a^4*x^4+11*a^2*x^2-4)/a+2*(-c*(a^2*x^2-1))^(1/2)*(-a
^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*ln(I*a*x+(-a^2*x^2+1)^(1/2))-(-c*(a^2*x^2
-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1
/2))^2)+4/3*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)/a/c^3/(a^2*x^2-1)*a
rcsin(a*x)^3-2*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*
arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*I*(-a^2*x^2+1)^(1/2)*(-c
*(a^2*x^2-1))^(1/2)/a/c^3/(a^2*x^2-1)*arcsin(a*x)*polylog(2,-(I*a*x+(-a^2*x
^2+1)^(1/2))^2)-(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)
*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)
```

Maxima [A]
time = 0.67, size = 106, normalized size = 0.27

$$\frac{1}{2}\,a\left(\frac{1}{a^4c^{\frac{5}{2}}x^2-a^2c^{\frac{5}{2}}}+\frac{2\,\log\left(ax+1\right)}{a^2c^{\frac{5}{2}}}+\frac{2\,\log\left(ax-1\right)}{a^2c^{\frac{5}{2}}}\right)\arcsin\left(ax\right)^2+\frac{1}{3}\left(\frac{2\,x}{\sqrt{-a^2cx^2+c}\,c^2}+\frac{x}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}c}\right)\arcsin\left(ax\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/2*a*(1/(a^4*c^(5/2)*x^2 - a^2*c^(5/2)) + 2*log(a*x + 1)/(a^2*c^(5/2)) + 2
*log(a*x - 1)/(a^2*c^(5/2)))*arcsin(a*x)^2 + 1/3*(2*x/(sqrt(-a^2*c*x^2 + c)
*c^2) + x/((-a^2*c*x^2 + c)^(3/2)*c))*arcsin(a*x)^3
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 +
 3*a^2*c^3*x^2 - c^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^3(ax)}{(-c(ax-1)(ax+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\mathrm{asin}\left(a\,x\right)}^3}{{\left(c-a^2\,c\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(5/2),x)
```

```
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(5/2), x)
```

3.301 $\int \frac{\textbf{ArcSin}(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx$

Optimal. Leaf size=547

$$-\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)}{c^3\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}}-\frac{3\text{ArcSin}(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2}}$$

```
[Out] 1/5*x*arcsin(a*x)^3/c/(-a^2*c*x^2+c)^(5/2)+4/15*x*arcsin(a*x)^3/c^2/(-a^2*c
*x^2+c)^(3/2)+x*arcsin(a*x)/c^3/(-a^2*c*x^2+c)^(1/2)+1/10*x*arcsin(a*x)/c^3
/(-a^2*x^2+1)/(-a^2*c*x^2+c)^(1/2)-3/20*arcsin(a*x)^2/a/c^3/(-a^2*x^2+1)^(3
/2)/(-a^2*c*x^2+c)^(1/2)+8/15*x*arcsin(a*x)^3/c^3/(-a^2*c*x^2+c)^(1/2)-1/20
/a/c^3/(-a^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-2/5*arcsin(a*x)^2/a/c^3/(-a^
2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-8/15*I*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)
/a/c^3/(-a^2*c*x^2+c)^(1/2)+8/5*arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2
))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)+1/2*ln(-a^2*x^2+1)*(-a^
2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)-8/5*I*arcsin(a*x)*polylog(2,-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)+4/5
*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*
x^2+c)^(1/2)
```

Rubi [A]
time = 0.35, antiderivative size = 547, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4747, 4745, 4765, 3800, 2221, 2611, 2320, 6724, 4767, 266, 267}

$$-\frac{8i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\text{Li}_2\left(-e^{2i\text{ArcSin}(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}+\frac{4\sqrt{1-a^2x^2}\,\text{Li}_3\left(-e^{2i\text{ArcSin}(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}+\frac{8x\text{ArcSin}(ax)^3}{15c^3\sqrt{c-a^2cx^2}}-\frac{8i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{15ac^3\sqrt{c-a^2cx^2}}-\frac{2\text{ArcSin}(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}-\frac{3\text{ArcSin}(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)}{c^3\sqrt{c-a^2cx^2}}+\frac{x\text{ArcSin}(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}}+\frac{8\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2\log\left(1+e^{2i\text{ArcSin}(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}+\frac{4x\text{ArcSin}(ax)^3}{15c^2(c-a^2cx^2)^{3/2}}+\frac{x\text{ArcSin}(ax)^3}{5c(c-a^2cx^2)^{5/2}}-\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^3\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -1/20*1/(a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(c^
3*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(10*c^3*(1 - a^2*x^2)*Sqrt[c - a^2
*c*x^2]) - (3*ArcSin[a*x]^2)/(20*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x
^2]) - (2*ArcSin[a*x]^2)/(5*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) +
(x*ArcSin[a*x]^3)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^3)/(15*c^2
*(c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x]^3)/(15*c^3*Sqrt[c - a^2*c*x^2])
- (((8*I)/15)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(a*c^3*Sqrt[c - a^2*c*x^2])
+ (8*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(5*a*c
^3*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^3*Sqr
t[c - a^2*c*x^2]) - (((8*I)/5)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^
((2*I)*ArcSin[a*x])])/(a*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Po
lyLog[3, -E^((2*I)*ArcSin[a*x])])/(5*a*c^3*Sqrt[c - a^2*c*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = \frac{x\sin^{-1}(ax)^3}{5c\,(c-a^2cx^2)^{5/2}} + \frac{4\int \frac{\sin^{-1}(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx}{5c} - \frac{\left(3a\sqrt{1-a^2x^2}\right)\int \frac{x\sin^{-1}(ax)^2}{(1-a^2x^2)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{3\sin^{-1}(ax)^2}{20ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)^3}{5c\,(c-a^2cx^2)^{5/2}} + \frac{4x\sin^{-1}(ax)^3}{15c^2\,(c-a^2cx^2)^{3/2}} + \frac{8\int \cdots}{\cdots}$$

$$= \frac{x\sin^{-1}(ax)}{10c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\sin^{-1}(ax)^2}{20ac^3\,(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\sin^{-1}(a\cdots}{5ac^3\sqrt{1-a^2x^2}\cdots}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \cdots$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \cdots$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \cdots$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \cdots$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \cdots$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\sin^{-1}(ax)}{10c^3\,(1-a^2x^2)\sqrt{c-a^2cx^2}} - \cdots$$

<u>Mathematica</u> **[A]**
time = 0.53, size = 319, normalized size = 0.58

$$\frac{-\frac{3}{\sqrt{1-a^2x^2}} + 60ax\text{ArcSin}(ax) + \frac{6ax\text{ArcSin}(ax)}{1-a^2x^2} - \frac{9\text{ArcSin}(ax)^2}{(1-a^2x^2)^{3/2}} - \frac{24\text{ArcSin}(ax)^2}{\sqrt{1-a^2x^2}} + 32ax\text{ArcSin}(ax)^3 + \frac{16ax\text{ArcSin}(ax)^3}{1-a^2x^2} - 32i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3 + \frac{12ax\text{ArcSin}(ax)^3}{(-1+a^2x^2)^2} + 96\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^2\log\left(1+e^{2i\text{ArcSin}(ax)}\right) + 30\sqrt{1-a^2x^2}\,\log\left(1-a^2x^2\right) - 96i\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)\text{PolyLog}\left(2,-e^{2i\text{ArcSin}(ax)}\right) + 48\sqrt{1-a^2x^2}\,\text{PolyLog}\left(3,-e^{2i\text{ArcSin}(ax)}\right)}{60ac^3\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] (-3/Sqrt[1 - a^2*x^2] + 60*a*x*ArcSin[a*x] + (6*a*x*ArcSin[a*x])/(1 - a^2*x
^2) - (9*ArcSin[a*x]^2)/(1 - a^2*x^2)^(3/2) - (24*ArcSin[a*x]^2)/Sqrt[1 - a
^2*x^2] + 32*a*x*ArcSin[a*x]^3 + (16*a*x*ArcSin[a*x]^3)/(1 - a^2*x^2) - (32
*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + (12*a*x*ArcSin[a*x]^3)/(-1 + a^2*x^2)
^2 + 96*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])] + 30
*Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2] - (96*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*
```

```
PolyLog[2, -E^((2*I)*ArcSin[a*x])] + 48*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2
*I)*ArcSin[a*x])])/(60*a*c^3*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.28, size = 1017, normalized size = 1.86

method	result
default	$-\frac{\sqrt{-c\left(a^{2} x^{2}-1\right)}\,\left(8 a^{5} x^{5}-20 a^{3} x^{3}+8 i \sqrt{-a^{2} x^{2}+1}\, a^{4} x^{4}+15 a x-16 i \sqrt{-a^{2} x^{2}+1}\, a^{2} x^{2}+8 i \sqrt{-a^{2} x^{2}+1}\right)\left(16\cdots\right.}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/2)*a
^4*x^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+8*I*(-a^2*x^2+1)^(1/2))*(160*
a^4*x^4*arcsin(a*x)^3+1590*a^4*x^4*arcsin(a*x)+105*a^3*x^3*(-a^2*x^2+1)^(1/
2)-1410*a^2*x^2*arcsin(a*x)+24*I-45*a*x*(-a^2*x^2+1)^(1/2)+256*arcsin(a*x)^
3+480*arcsin(a*x)+24*(-a^2*x^2+1)^(1/2)*a^7*x^7+372*I*arcsin(a*x)*(-a^2*x^2
+1)^(1/2)*a*x-192*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^7*x^7+756*I*arcsin(a*x
)*(-a^2*x^2+1)^(1/2)*a^5*x^5-936*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^3*x^3+2
64*I*arcsin(a*x)^2+192*arcsin(a*x)*a^8*x^8-852*arcsin(a*x)*a^6*x^6-380*arcs
in(a*x)^3*a^2*x^2+1020*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^3*x^3-495*arcsin(
a*x)^2*(-a^2*x^2+1)^(1/2)*a*x-84*(-a^2*x^2+1)^(1/2)*a^5*x^5+192*arcsin(a*x)
^2*(-a^2*x^2+1)^(1/2)*a^7*x^7-744*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^5*x^5+
192*I*arcsin(a*x)^2*a^8*x^8-840*I*arcsin(a*x)^2*a^6*x^6+1368*I*arcsin(a*x)^
2*a^4*x^4-984*I*arcsin(a*x)^2*a^2*x^2+144*I*a^4*x^4-96*I*a^2*x^2+24*I*a^8*x
^8-96*I*a^6*x^6)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+287*
a^2*x^2-64)/a+2*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)
*ln(I*a*x+(-a^2*x^2+1)^(1/2))-(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c
^4/(a^2*x^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+16/15*I*(-a^2*x^2+1)^(1/2
)*(-c*(a^2*x^2-1))^(1/2)/a/c^4/(a^2*x^2-1)*arcsin(a*x)^3-8/5*(-c*(a^2*x^2-1
))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*arcsin(a*x)^2*ln(1+(I*a*x+(-a
^2*x^2+1)^(1/2))^2)+8/5*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)/a/c^4/(
a^2*x^2-1)*arcsin(a*x)*polylog(2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-4/5*(-c*(a^
2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*polylog(3,-(I*a*x+(-a^
2*x^2+1)^(1/2))^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(7/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 +
6*a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^3(ax)}{(-c(ax-1)(ax+1))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(7/2),x)
```

```
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(7/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(7/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\mathrm{asin}\left(a\,x\right)}^3}{{\left(c-a^2\,c\,x^2\right)}^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(7/2),x)
```

```
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(7/2), x)
```

3.302 $\int \frac{x^m \mathbf{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m \text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Defer[Int][(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\int \frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A]
time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{x^m \text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Integrate[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2], x]
```

Maple [A]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^3/(a^2*x^2 - 1), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \operatorname{asin}^3(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)**3/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^m*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.303 $\int \frac{x^4 \textbf{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=191

$$-\frac{45x^2}{128a^3}-\frac{3x^4}{128a}+\frac{45x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{64a^4}+\frac{3x^3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{32a^2}-\frac{45\text{ArcSin}(ax)^2}{128a^5}+\frac{9x^2\text{ArcSin}(ax)^2}{16a^3}$$

```
[Out] -45/128*x^2/a^3-3/128*x^4/a-45/128*arcsin(a*x)^2/a^5+9/16*x^2*arcsin(a*x)^2
/a^3+3/16*x^4*arcsin(a*x)^2/a+3/32*arcsin(a*x)^4/a^5+45/64*x*arcsin(a*x)*(-
a^2*x^2+1)^(1/2)/a^4+3/32*x^3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2-3/8*x*arcs
in(a*x)^3*(-a^2*x^2+1)^(1/2)/a^4-1/4*x^3*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a
^2
```

Rubi [A]
time = 0.32, antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4795, 4737, 4723, 30}

$$\frac{3\text{ArcSin}(ax)^4}{32a^5}-\frac{45\text{ArcSin}(ax)^2}{128a^5}+\frac{9x^2\text{ArcSin}(ax)^2}{16a^3}-\frac{45x^2}{128a^3}-\frac{x^3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{4a^2}+\frac{3x^3\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{32a^2}-\frac{3x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{8a^4}+\frac{45x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{64a^4}+\frac{3x^4\text{ArcSin}(ax)^2}{16a}-\frac{3x^4}{128a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-45*x^2)/(128*a^3) - (3*x^4)/(128*a) + (45*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]
)/(64*a^4) + (3*x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(32*a^2) - (45*ArcSin[a*
x]^2)/(128*a^5) + (9*x^2*ArcSin[a*x]^2)/(16*a^3) + (3*x^4*ArcSin[a*x]^2)/(1
6*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]^3)/(4*a^2) + (3*ArcSin[a*x]^4)/(32*a^5)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \frac{x^4\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{4a^2} + \frac{3\int \frac{x^2\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{4a^2} + \frac{3\int x^3\sin^{-1}(ax)^2\,dx}{4a}$$

$$= \frac{3x^4\sin^{-1}(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{4a^2} - \frac{3}{8}\int \frac{x^4\sin^{-}}{\sqrt{1-}}$$

$$= \frac{3x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{32a^2} + \frac{9x^2\sin^{-1}(ax)^2}{16a^3} + \frac{3x^4\sin^{-1}(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(a}{8a^4}$$

$$= -\frac{3x^4}{128a} + \frac{45x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{64a^4} + \frac{3x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{32a^2} + \frac{9x^2\sin^{-1}(ax)^2}{16a^3} + \frac{3}{}$$

$$= -\frac{45x^2}{128a^3} - \frac{3x^4}{128a} + \frac{45x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{64a^4} + \frac{3x^3\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{32a^2} - \frac{45\sin^{-1}(a}{128a^5}$$

Mathematica [A]
time = 0.04, size = 125, normalized size = 0.65

$$\frac{-3a^2x^2(15+a^2x^2)+6ax\sqrt{1-a^2x^2}\,(15+2a^2x^2)\,\text{ArcSin}(ax)+3(-15+24a^2x^2+8a^4x^4)\,\text{ArcSin}(ax)^2-16ax\sqrt{1-a^2x^2}\,(3+2a^2x^2)\,\text{ArcSin}(ax)^3+12\text{ArcSin}(ax)^4}{128a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*a^2*x^2*(15 + a^2*x^2) + 6*a*x*Sqrt[1 - a^2*x^2]*(15 + 2*a^2*x^2)*ArcSi
n[a*x] + 3*(-15 + 24*a^2*x^2 + 8*a^4*x^4)*ArcSin[a*x]^2 - 16*a*x*Sqrt[1 - a
^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x]^3 + 12*ArcSin[a*x]^4)/(128*a^5)
```

Maple [A]
time = 0.12, size = 160, normalized size = 0.84

method	result
default	$\frac{-128\arcsin(ax)^3\sqrt{-a^2x^2+1}\,a^3x^3+96a^4x^4\arcsin(ax)^2+48\arcsin(ax)\sqrt{-a^2x^2+1}\,a^3x^3-12a^4x^4-192\arcsin(ax)^3\sqrt{-}}{512a^5}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/512*(-128*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)*a^3*x^3+96*a^4*x^4*arcsin(a*x)
^2+48*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^3*x^3-12*a^4*x^4-192*arcsin(a*x)^3*(
-a^2*x^2+1)^(1/2)*a*x+288*arcsin(a*x)^2*a^2*x^2+48*arcsin(a*x)^4+360*a*x*ar
csin(a*x)*(-a^2*x^2+1)^(1/2)-180*a^2*x^2-180*arcsin(a*x)^2-27)/a^5
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Fricas [A]
time = 1.73, size = 111, normalized size = 0.58

$$-\frac{3\,a^4x^4+45\,a^2x^2-12\,\arcsin(ax)^4-3\,(8\,a^4x^4+24\,a^2x^2-15)\arcsin(ax)^2+2\,\sqrt{-a^2x^2+1}\,(8\,(2\,a^3x^3+3\,ax)\arcsin(ax)^3-3\,(2\,a^3x^3+15\,ax)\arcsin(ax))}{128\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/128*(3*a^4*x^4 + 45*a^2*x^2 - 12*arcsin(a*x)^4 - 3*(8*a^4*x^4 + 24*a^2*x
^2 - 15)*arcsin(a*x)^2 + 2*sqrt(-a^2*x^2 + 1)*(8*(2*a^3*x^3 + 3*a*x)*arcsin
(a*x)^3 - 3*(2*a^3*x^3 + 15*a*x)*arcsin(a*x)))/a^5
```

Sympy [A]
time = 0.89, size = 185, normalized size = 0.97

$$\begin{cases} \frac{3x^4\operatorname{asin}^2(ax)}{16a} - \frac{3x^4}{128a} - \frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{4a^2} + \frac{3x^3\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{32a^2} + \frac{9x^2\operatorname{asin}^2(ax)}{16a^3} - \frac{45x^2}{128a^3} - \frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{8a^4} + \frac{45x\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{64a^4} + \frac{3\operatorname{asin}^4(ax)}{32a^5} - \frac{45\operatorname{asin}^2(ax)}{128a^5} & \text{for}\ a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((3*x**4*asin(a*x)**2/(16*a) - 3*x**4/(128*a) - x**3*sqrt(-a**2*x*
*2 + 1)*asin(a*x)**3/(4*a**2) + 3*x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)/(32*a
**2) + 9*x**2*asin(a*x)**2/(16*a**3) - 45*x**2/(128*a**3) - 3*x*sqrt(-a**2*
x**2 + 1)*asin(a*x)**3/(8*a**4) + 45*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(64*a
**4) + 3*asin(a*x)**4/(32*a**5) - 45*asin(a*x)**2/(128*a**5), Ne(a, 0)), (0
, True))
```

Giac [A]
time = 0.44, size = 192, normalized size = 1.01

$$\frac{(-a^2x^2+1)^{\frac{3}{2}}x\arcsin(ax)^3}{4a^4}-\frac{5\sqrt{-a^2x^2+1}\,x\arcsin(ax)^3}{8a^4}-\frac{3(-a^2x^2+1)^{\frac{3}{2}}x\arcsin(ax)}{32a^4}+\frac{3(a^2x^2-1)^2\arcsin(ax)^2}{16a^5}+\frac{3\arcsin(ax)^4}{32a^5}+\frac{51\sqrt{-a^2x^2+1}\,x\arcsin(ax)}{64a^4}+\frac{15(a^2x^2-1)\arcsin(ax)^2}{16a^5}-\frac{3(a^2x^2-1)^2}{128a^5}+\frac{51\arcsin(ax)^2}{128a^5}-\frac{51(a^2x^2-1)}{128a^5}-\frac{195}{1024a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)^3/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arc
sin(a*x)^3/a^4 - 3/32*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)/a^4 + 3/16*(a^2*x^
2 - 1)^2*arcsin(a*x)^2/a^5 + 3/32*arcsin(a*x)^4/a^5 + 51/64*sqrt(-a^2*x^2 +
 1)*x*arcsin(a*x)/a^4 + 15/16*(a^2*x^2 - 1)*arcsin(a*x)^2/a^5 - 3/128*(a^2*
x^2 - 1)^2/a^5 + 51/128*arcsin(a*x)^2/a^5 - 51/128*(a^2*x^2 - 1)/a^5 - 195/
1024/a^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4\,\mathrm{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^4*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.304 $\int \frac{x^3 \textbf{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=157

$$-\frac{40x}{9a^3}-\frac{2x^3}{27a}+\frac{40\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{9a^4}+\frac{2x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{9a^2}+\frac{2x\text{ArcSin}(ax)^2}{a^3}+\frac{x^3\text{ArcSin}(ax)^2}{3a}-2\surd$$

```
[Out] -40/9*x/a^3-2/27*x^3/a+2*x*arcsin(a*x)^2/a^3+1/3*x^3*arcsin(a*x)^2/a+40/9*a
rcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^4+2/9*x^2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^
2-2/3*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a^4-1/3*x^2*arcsin(a*x)^3*(-a^2*x^2+
1)^(1/2)/a^2
```

Rubi [A]
time = 0.23, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4795, 4767, 4715, 8, 4723, 30}

$$\frac{2x\text{ArcSin}(ax)^2}{a^3}-\frac{40x}{9a^3}-\frac{x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{3a^2}+\frac{2x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{9a^2}-\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{3a^4}+\frac{40\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{9a^4}+\frac{x^3\text{ArcSin}(ax)^2}{3a}-\frac{2x^3}{27a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-40*x)/(9*a^3) - (2*x^3)/(27*a) + (40*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^
4) + (2*x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^2) + (2*x*ArcSin[a*x]^2)/a^
3 + (x^3*ArcSin[a*x]^2)/(3*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^4)
 - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
```

```
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx &= -\frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{3a^2} + \frac{2\int \frac{x\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{3a^2} + \frac{\int x^2\sin^{-1}(ax)^2\,dx}{a} \\
&= \frac{x^3\sin^{-1}(ax)^2}{3a} - \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{3a^2} - \frac{2}{3}\int \frac{x^3\sin^{-1}(}{\sqrt{1-a^2}} \\
&= \frac{2x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{9a^2} + \frac{2x\sin^{-1}(ax)^2}{a^3} + \frac{x^3\sin^{-1}(ax)^2}{3a} - \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{3a^4} \\
&= -\frac{2x^3}{27a} + \frac{40\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{9a^4} + \frac{2x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{9a^2} + \frac{2x\sin^{-1}(ax)^2}{a^3} + \frac{x^3\,\mathrm{si}}{} \\
&= -\frac{40x}{9a^3} - \frac{2x^3}{27a} + \frac{40\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{9a^4} + \frac{2x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{9a^2} + \frac{2x\sin^{-1}(ax)^2}{a^3}
\end{aligned}$$

Mathematica [A]
time = 0.03, size = 100, normalized size = 0.64

$$\frac{-2ax(60+a^2x^2)+6\sqrt{1-a^2x^2}\,(20+a^2x^2)\,\mathrm{ArcSin}(ax)+9ax(6+a^2x^2)\,\mathrm{ArcSin}(ax)^2-9\sqrt{1-a^2x^2}\,(2+a^2x^2)\,\mathrm{ArcSin}(ax)^3}{27a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-2*a*x*(60 + a^2*x^2) + 6*Sqrt[1 - a^2*x^2]*(20 + a^2*x^2)*ArcSin[a*x] + 9
*a*x*(6 + a^2*x^2)*ArcSin[a*x]^2 - 9*Sqrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin
[a*x]^3)/(27*a^4)
```

Maple [A]
time = 0.12, size = 180, normalized size = 1.15

method	result
default	$-\frac{\left(9a^4x^4\arcsin(ax)^3+9\arcsin(ax)^3a^2x^2+9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^3x^3-6a^4x^4\arcsin(ax)-114a^2x^2\arcsin(ax)-2a^3x^3\sqrt{\ }\right.}{27a^4(}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/27/a^4*(9*a^4*x^4*arcsin(a*x)^3+9*arcsin(a*x)^3*a^2*x^2+9*arcsin(a*x)^2*
(-a^2*x^2+1)^(1/2)*a^3*x^3-6*a^4*x^4*arcsin(a*x)-114*a^2*x^2*arcsin(a*x)-2*
a^3*x^3*(-a^2*x^2+1)^(1/2)-18*arcsin(a*x)^3+54*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)*a*x+120*arcsin(a*x)-120*a*x*(-a^2*x^2+1)^(1/2))*(-a^2*x^2+1)^(1/2)/(a^
2*x^2-1)
```

Maxima [A]
time = 0.48, size = 131, normalized size = 0.83

$$-\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}\,x^2}{a^2}+\frac{2\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin(ax)^3+\frac{2}{27}a\left(\frac{3\left(\sqrt{-a^2x^2+1}\,x^2+\frac{20\sqrt{-a^2x^2+1}}{a^2}\right)\arcsin(ax)}{a^3}-\frac{a^2x^3+60x}{a^4}\right)+\frac{(a^2x^3+6x)\arcsin(ax)^2}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x^2 + 1)/a^4)*arcsin(a*x)^3
+ 2/27*a*(3*(sqrt(-a^2*x^2 + 1)*x^2 + 20*sqrt(-a^2*x^2 + 1)/a^2)*arcsin(a*x
)/a^3 - (a^2*x^3 + 60*x)/a^4) + 1/3*(a^2*x^3 + 6*x)*arcsin(a*x)^2/a^3
```

Fricas [A]
time = 1.52, size = 85, normalized size = 0.54

$$-\frac{2a^3x^3-9(a^3x^3+6ax)\arcsin(ax)^2+120ax+3\sqrt{-a^2x^2+1}\left(3(a^2x^2+2)\arcsin(ax)^3-2(a^2x^2+20)\arcsin(ax)\right)}{27a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/27*(2*a^3*x^3 - 9*(a^3*x^3 + 6*a*x)*arcsin(a*x)^2 + 120*a*x + 3*sqrt(-a^
2*x^2 + 1)*(3*(a^2*x^2 + 2)*arcsin(a*x)^3 - 2*(a^2*x^2 + 20)*arcsin(a*x)))/
a^4
```

Sympy [A]
time = 0.63, size = 148, normalized size = 0.94

$$\begin{cases} \frac{x^3 \operatorname{asin}^2(ax)}{3a} - \frac{2x^3}{27a} - \frac{x^2\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{3a^2} + \frac{2x^2\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{9a^2} + \frac{2x\operatorname{asin}^2(ax)}{a^3} - \frac{40x}{9a^3} - \frac{2\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{3a^4} + \frac{40\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{9a^4} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**3*asin(a*x)**2/(3*a) - 2*x**3/(27*a) - x**2*sqrt(-a**2*x**2 +
 1)*asin(a*x)**3/(3*a**2) + 2*x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(9*a**2)
+ 2*x*asin(a*x)**2/a**3 - 40*x/(9*a**3) - 2*sqrt(-a**2*x**2 + 1)*asin(a*x)*
*3/(3*a**4) + 40*sqrt(-a**2*x**2 + 1)*asin(a*x)/(9*a**4), Ne(a, 0)), (0, Tr
ue))
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3 \operatorname{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^3*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.305 $\int \frac{x^2 \mathbf{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=107

$$-\frac{3x^2}{8a}+\frac{3x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{4a^2}-\frac{3\text{ArcSin}(ax)^2}{8a^3}+\frac{3x^2\text{ArcSin}(ax)^2}{4a}-\frac{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{2a^2}+\frac{\text{ArcSin}(ax}{8a^3}$$

```
[Out] -3/8*x^2/a-3/8*arcsin(a*x)^2/a^3+3/4*x^2*arcsin(a*x)^2/a+1/8*arcsin(a*x)^4/
a^3+3/4*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2-1/2*x*arcsin(a*x)^3*(-a^2*x^2+
1)^(1/2)/a^2
```

Rubi [A]
time = 0.15, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4795, 4737, 4723, 30}

$$\frac{\text{ArcSin}(ax)^4}{8a^3}-\frac{3\text{ArcSin}(ax)^2}{8a^3}-\frac{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{2a^2}+\frac{3x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}{4a^2}+\frac{3x^2\text{ArcSin}(ax)^2}{4a}-\frac{3x^2}{8a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*x^2)/(8*a) + (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) - (3*ArcSin[a*
x]^2)/(8*a^3) + (3*x^2*ArcSin[a*x]^2)/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a
*x]^3)/(2*a^2) + ArcSin[a*x]^4/(8*a^3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx &= -\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2a^2}+\frac{\int \frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{2a^2}+\frac{3\int x\sin^{-1}(ax)^2\,dx}{2a}\\ &= \frac{3x^2\sin^{-1}(ax)^2}{4a}-\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2a^2}+\frac{\sin^{-1}(ax)^4}{8a^3}-\frac{3}{2}\int \frac{x^2\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx\\ &= \frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{4a^2}+\frac{3x^2\sin^{-1}(ax)^2}{4a}-\frac{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2a^2}+\frac{\sin^{-1}(ax)^4}{8a^3}-\\ &= -\frac{3x^2}{8a}+\frac{3x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{4a^2}-\frac{3\sin^{-1}(ax)^2}{8a^3}+\frac{3x^2\sin^{-1}(ax)^2}{4a}-\frac{x\sqrt{1-a^2x^2}\,\sin}{2a^2}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 85, normalized size = 0.79

$$\frac{-3a^2x^2+6ax\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)+(-3+6a^2x^2)\,\text{ArcSin}(ax)^2-4ax\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3+\text{ArcSin}(ax)^4}{8a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*a^2*x^2 + 6*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + (-3 + 6*a^2*x^2)*ArcSin
[a*x]^2 - 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + ArcSin[a*x]^4)/(8*a^3)
```

Maple [A]
time = 0.13, size = 85, normalized size = 0.79

method	result	si
default	$\frac{-4\arcsin(ax)^3\sqrt{-a^2x^2+1}\,ax+6\arcsin(ax)^2a^2x^2+\arcsin(ax)^4+6ax\arcsin(ax)\sqrt{-a^2x^2+1}-3a^2x^2-3\arcsin(ax)^2}{8a^3}$	85

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

[Out] 1/8*(-4*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)*a*x+6*arcsin(a*x)^2*a^2*x^2+arcsin(a*x)^4+6*a*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)-3*a^2*x^2-3*arcsin(a*x)^2)/a^3

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(x^2*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)

Fricas [A]
time = 1.72, size = 73, normalized size = 0.68

$$-\frac{3\,a^2x^2-\arcsin\left(ax\right)^4-3\left(2\,a^2x^2-1\right)\arcsin\left(ax\right)^2+2\left(2\,ax\arcsin\left(ax\right)^3-3\,ax\arcsin\left(ax\right)\right)\sqrt{-a^2x^2+1}}{8\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] -1/8*(3*a^2*x^2 - arcsin(a*x)^4 - 3*(2*a^2*x^2 - 1)*arcsin(a*x)^2 + 2*(2*a*x*arcsin(a*x)^3 - 3*a*x*arcsin(a*x))*sqrt(-a^2*x^2 + 1))/a^3

Sympy [A]
time = 0.45, size = 100, normalized size = 0.93

$$\begin{cases}\frac{3x^2\operatorname{asin}^2\left(ax\right)}{4a}-\frac{3x^2}{8a}-\frac{x\sqrt{-a^2x^2+1}\operatorname{asin}^3\left(ax\right)}{2a^2}+\frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}\left(ax\right)}{4a^2}+\frac{\operatorname{asin}^4\left(ax\right)}{8a^3}-\frac{3\operatorname{asin}^2\left(ax\right)}{8a^3} & \text{for } a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**2*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)

[Out] Piecewise((3*x**2*asin(a*x)**2/(4*a) - 3*x**2/(8*a) - x*sqrt(-a**2*x**2 + 1)*asin(a*x)**3/(2*a**2) + 3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(4*a**2) + asin(a*x)**4/(8*a**3) - 3*asin(a*x)**2/(8*a**3), Ne(a, 0)), (0, True))

Giac [A]
time = 0.47, size = 108, normalized size = 1.01

$$-\frac{\sqrt{-a^2x^2+1}\,x\arcsin\left(ax\right)^3}{2\,a^2}+\frac{\arcsin\left(ax\right)^4}{8\,a^3}+\frac{3\,\sqrt{-a^2x^2+1}\,x\arcsin\left(ax\right)}{4\,a^2}+\frac{3\left(a^2x^2-1\right)\arcsin\left(ax\right)^2}{4\,a^3}+\frac{3\,\arcsin\left(ax\right)^2}{8\,a^3}-\frac{3\left(a^2x^2-1\right)}{8\,a^3}-\frac{3}{16\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^3/a^2 + 1/8*arcsin(a*x)^4/a^3 + 3/4*s
qrt(-a^2*x^2 + 1)*x*arcsin(a*x)/a^2 + 3/4*(a^2*x^2 - 1)*arcsin(a*x)^2/a^3 +
 3/8*arcsin(a*x)^2/a^3 - 3/8*(a^2*x^2 - 1)/a^3 - 3/16/a^3
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 \operatorname{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^2*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.306 $\int \frac{x\mathbf{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=67

$$-\frac{6x}{a}+\frac{6\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{a^2}+\frac{3x\mathrm{ArcSin}(ax)^2}{a}-\frac{\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^3}{a^2}$$

```
[Out] -6*x/a+3*x*arcsin(a*x)^2/a+6*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2-arcsin(a*x)
^3*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A]
time = 0.08, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4767, 4715, 8}

$$-\frac{\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^3}{a^2}+\frac{6\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}{a^2}+\frac{3x\mathrm{ArcSin}(ax)^2}{a}-\frac{6x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-6*x)/a + (6*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2 + (3*x*ArcSin[a*x]^2)/a -
(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/a^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x \sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{a^2} + \frac{3\int \sin^{-1}(ax)^2\,dx}{a}$$
$$= \frac{3x\sin^{-1}(ax)^2}{a} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{a^2} - 6\int \frac{x\sin^{-1}(ax)}{\sqrt{1-a^2x^2}}\,dx$$
$$= \frac{6\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2} + \frac{3x\sin^{-1}(ax)^2}{a} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{a^2} - \frac{6\int 1\,dx}{a}$$
$$= -\frac{6x}{a} + \frac{6\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}{a^2} + \frac{3x\sin^{-1}(ax)^2}{a} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{a^2}$$

Mathematica [A]
time = 0.01, size = 61, normalized size = 0.91

$$\frac{-6ax + 6\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax) + 3ax\mathrm{ArcSin}(ax)^2 - \sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^3}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-6*a*x + 6*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + 3*a*x*ArcSin[a*x]^2 - Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/a^2
```

Maple [A]
time = 0.10, size = 107, normalized size = 1.60

method	result
default	$-\frac{\sqrt{-a^2x^2+1}\,\left(\arcsin(ax)^3a^2x^2-\arcsin(ax)^3+3\arcsin(ax)^2\sqrt{-a^2x^2+1}\,ax-6a^2x^2\arcsin(ax)+6\arcsin(ax)-6ax\sqrt{-a\right.}{a^2(a^2x^2-1)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(arcsin(a*x)^3*a^2*x^2-arcsin(a*x)^3+3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a*x-6*a^2*x^2*arcsin(a*x)+6*arcsin(a*x)-6*a*x*(-a^2*x^2+1)^(1/2))
```

Maxima [A]
time = 0.46, size = 64, normalized size = 0.96

$$\frac{3\,x\arcsin\left(ax\right)^2}{a} - \frac{\sqrt{-a^2x^2+1}\,\arcsin\left(ax\right)^3}{a^2} - \frac{6\left(x - \frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)}{a}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 3*x*arcsin(a*x)^2/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/a^2 - 6*(x - sqrt(-a
^2*x^2 + 1)*arcsin(a*x)/a)/a
```

Fricas [A]
time = 1.93, size = 46, normalized size = 0.69

$$\frac{3\,ax\arcsin\left(ax\right)^{2}-6\,ax-\sqrt{-a^{2}x^{2}+1}\,\left(\arcsin\left(ax\right)^{3}-6\,\arcsin\left(ax\right)\right)}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (3*a*x*arcsin(a*x)^2 - 6*a*x - sqrt(-a^2*x^2 + 1)*(arcsin(a*x)^3 - 6*arcsin
(a*x)))/a^2
```

Sympy [A]
time = 0.41, size = 61, normalized size = 0.91

$$\begin{cases}\frac{3x\operatorname{asin}^{2}\left(ax\right)}{a}-\frac{6x}{a}-\frac{\sqrt{-a^{2}x^{2}+1}\operatorname{asin}^{3}\left(ax\right)}{a^{2}}+\frac{6\sqrt{-a^{2}x^{2}+1}\operatorname{asin}\left(ax\right)}{a^{2}} & \text{for}\ a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((3*x*asin(a*x)**2/a - 6*x/a - sqrt(-a**2*x**2 + 1)*asin(a*x)**3/a
**2 + 6*sqrt(-a**2*x**2 + 1)*asin(a*x)/a**2, Ne(a, 0)), (0, True))
```

Giac [A]
time = 0.45, size = 62, normalized size = 0.93

$$-\frac{\sqrt{-a^{2}x^{2}+1}\,\arcsin\left(ax\right)^{3}}{a^{2}}+\frac{3\left(x\arcsin\left(ax\right)^{2}-2\,x+\frac{2\sqrt{-a^{2}x^{2}+1}\,\arcsin(ax)}{a}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/a^2 + 3*(x*arcsin(a*x)^2 - 2*x + 2*sqrt(-
a^2*x^2 + 1)*arcsin(a*x)/a)/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{asin}(a\,x)^{3}}{\sqrt{1-a^{2}\,x^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.307 $\int \frac{\text{ArcSin}(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=13

$$\frac{\text{ArcSin}(ax)^4}{4a}$$

```
[Out] 1/4*arcsin(a*x)^4/a
```

Rubi [A]
time = 0.02, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {4737}

$$\frac{\text{ArcSin}(ax)^4}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^4/(4*a)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\sin^{-1}(ax)^4}{4a}$$

Mathematica [A]
time = 0.01, size = 13, normalized size = 1.00

$$\frac{\text{ArcSin}(ax)^4}{4a}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^4/(4*a)
```

Maple [A]
time = 0.09, size = 12, normalized size = 0.92

method	result	size
derivativedivides	$\frac{\arcsin(ax)^4}{4a}$	12
default	$\frac{\arcsin(ax)^4}{4a}$	12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

Maxima [A]
time = 0.46, size = 11, normalized size = 0.85

$$\frac{\arcsin(ax)^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

Fricas [A]
time = 7.31, size = 11, normalized size = 0.85

$$\frac{\arcsin(ax)^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

Sympy [A]
time = 0.25, size = 10, normalized size = 0.77

$$\begin{cases} \frac{\operatorname{asin}^4(ax)}{4a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((asin(a*x)**4/(4*a), Ne(a, 0)), (0, True))
```

Giac [**A**]
time = 0.46, size = 11, normalized size = 0.85

$$\frac{\arcsin{(ax)}^4}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*arcsin(a*x)^4/a
```

Mupad [**B**]
time = 0.15, size = 11, normalized size = 0.85

$$\frac{\mathrm{asin}(a\,x)^4}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] asin(a*x)^4/(4*a)
```

3.308 $\int \frac{\text{ArcSin}(ax)^3}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=138

$$-2\text{ArcSin}(ax)^3\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)+3i\text{ArcSin}(ax)^2\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right)-3i\text{ArcSin}(ax)^2\text{PolyLog}\left(2,e^{i\text{Arc}}\right.$$

```
[Out] -2*arcsin(a*x)^3*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+3*I*arcsin(a*x)^2*polylo
g(2,-I*a*x-(-a^2*x^2+1)^(1/2))-3*I*arcsin(a*x)^2*polylog(2,I*a*x+(-a^2*x^2+
1)^(1/2))-6*arcsin(a*x)*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+6*arcsin(a*x)*
polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))-6*I*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2)
)+6*I*polylog(4,I*a*x+(-a^2*x^2+1)^(1/2))
```

Rubi [A]
time = 0.12, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4803, 4268, 2611, 6744, 2320, 6724}

$$3i\text{ArcSin}(ax)^2\text{Li}_2\left(-e^{i\text{ArcSin}(ax)}\right)-3i\text{ArcSin}(ax)^2\text{Li}_2\left(e^{i\text{ArcSin}(ax)}\right)-6\text{ArcSin}(ax)\text{Li}_3\left(-e^{i\text{ArcSin}(ax)}\right)+6\text{ArcSin}(ax)\text{Li}_3\left(e^{i\text{ArcSin}(ax)}\right)-6i\text{Li}_4\left(-e^{i\text{ArcSin}(ax)}\right)+6i\text{Li}_4\left(e^{i\text{ArcSin}(ax)}\right)-2\text{ArcSin}(ax)^3\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]^3*ArcTanh[E^(I*ArcSin[a*x])] + (3*I)*ArcSin[a*x]^2*PolyLog[2
, -E^(I*ArcSin[a*x])] - (3*I)*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] -
 6*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 6*ArcSin[a*x]*PolyLog[3, E^
(I*ArcSin[a*x])] - (6*I)*PolyLog[4, -E^(I*ArcSin[a*x])] + (6*I)*PolyLog[4,
E^(I*ArcSin[a*x])]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sin^{-1}(ax)^3}{x\sqrt{1-a^2x^2}}\,dx &= \text{Subst}\left(\int x^3\csc(x)\,dx, x, \sin^{-1}(ax)\right)\\
&= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - 3\text{Subst}\left(\int x^2\log\left(1-e^{ix}\right)\,dx, x, \sin^{-1}(ax)\right) + \\
&= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}\\
&= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}\\
&= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}\\
&= -2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) + 3i\sin^{-1}(ax)^2\text{Li}_2\left(-e^{i\sin^{-1}(ax)}\right) - 3i\sin^{-1}(ax)^2\text{Li}
\end{aligned}$$

Mathematica [**A**]
time = 0.11, size = 180, normalized size = 1.30

$$-\frac{1}{8}i\left(\pi^4-2\text{ArcSin}(ax)^4+8i\text{ArcSin}(ax)^3\log\left(1-e^{-i\text{ArcSin}(ax)}\right)-8i\text{ArcSin}(ax)^3\log\left(1+e^{i\text{ArcSin}(ax)}\right)-24\text{ArcSin}(ax)^2\text{PolyLog}\left(2,e^{-i\text{ArcSin}(ax)}\right)-24\text{ArcSin}(ax)^2\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right)+48i\text{ArcSin}(ax)\text{PolyLog}\left(3,e^{-i\text{ArcSin}(ax)}\right)-48i\text{ArcSin}(ax)\text{PolyLog}\left(3,-e^{i\text{ArcSin}(ax)}\right)+48\text{PolyLog}\left(4,e^{-i\text{ArcSin}(ax)}\right)+48\text{PolyLog}\left(4,-e^{i\text{ArcSin}(ax)}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-1/8*I)*(Pi^4 - 2*ArcSin[a*x]^4 + (8*I)*ArcSin[a*x]^3*Log[1 - E^((-I)*ArcS
in[a*x])] - (8*I)*ArcSin[a*x]^3*Log[1 + E^(I*ArcSin[a*x])] - 24*ArcSin[a*x]
^2*PolyLog[2, E^((-I)*ArcSin[a*x])] - 24*ArcSin[a*x]^2*PolyLog[2, -E^(I*Arc
Sin[a*x])] + (48*I)*ArcSin[a*x]*PolyLog[3, E^((-I)*ArcSin[a*x])] - (48*I)*A
rcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 48*PolyLog[4, E^((-I)*ArcSin[a*
x])] + 48*PolyLog[4, -E^(I*ArcSin[a*x])])
```

Maple [**A**]
time = 0.12, size = 225, normalized size = 1.63

method	result
default	$i\left(i\arcsin(ax)^3\ln\left(1+iax+\sqrt{-a^2x^2+1}\right)+3\arcsin(ax)^2\,\text{polylog}\left(2,-iax-\sqrt{-a^2x^2+1}\right)+\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] I*(I*arcsin(a*x)^3*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+3*arcsin(a*x)^2*polylog(2
,-I*a*x-(-a^2*x^2+1)^(1/2))+6*I*arcsin(a*x)*polylog(3,-I*a*x-(-a^2*x^2+1)^(
1/2))-6*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))-I*arcsin(a*x)^3*ln(1-I*a*x-(-a
^2*x^2+1)^(1/2))-3*arcsin(a*x)^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-6*I*ar
csin(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))+6*polylog(4,I*a*x+(-a^2*x^2+1
)^(1/2)))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^3 - x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^3(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/x/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)**3/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{asin}(a\,x)^3}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(x*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^3/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.309 $\int \frac{\mathrm{ArcSin}(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=99

$$-ia\mathrm{ArcSin}(ax)^3-\frac{\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^3}{x}+3a\mathrm{ArcSin}(ax)^2\log\left(1-e^{2i\mathrm{ArcSin}(ax)}\right)-3ia\mathrm{ArcSin}(ax)\mathrm{PolyLog}\big(2,$$

```
[Out] -I*a*arcsin(a*x)^3+3*a*arcsin(a*x)^2*ln(1-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-3*I
*a*arcsin(a*x)*polylog(2,(I*a*x+(-a^2*x^2+1)^(1/2))^2)+3/2*a*polylog(3,(I*a
*x+(-a^2*x^2+1)^(1/2))^2)-arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/x
```

Rubi [A]
time = 0.14, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}=0.292$, Rules used = {4771, 4721, 3798, 2221, 2611, 2320, 6724}

$$-\frac{\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^3}{x}-3ia\mathrm{ArcSin}(ax)\mathrm{Li}_2\left(e^{2i\mathrm{ArcSin}(ax)}\right)+\frac{3}{2}a\mathrm{Li}_3\left(e^{2i\mathrm{ArcSin}(ax)}\right)-ia\mathrm{ArcSin}(ax)^3+3a\mathrm{ArcSin}(ax)^2\log\left(1-e^{2i\mathrm{ArcSin}(ax)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-I)*a*ArcSin[a*x]^3 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/x + 3*a*ArcSin[a*x
]^2*Log[1 - E^((2*I)*ArcSin[a*x])] - (3*I)*a*ArcSin[a*x]*PolyLog[2, E^((2*I
)*ArcSin[a*x])] + (3*a*PolyLog[3, E^((2*I)*ArcSin[a*x])])/2
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{x} + (3a)\int \frac{\sin^{-1}(ax)^2}{x}\,dx$$

$$= -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{x} + (3a)\text{Subst}\left(\int x^2\cot(x)\,dx, x, \sin^{-1}(ax)\right)$$

$$= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{x} - (6ia)\text{Subst}\left(\int \frac{e^{2ix}x^2}{1-e^{2ix}}\,dx, x, \sin^{-1}(ax)\right)$$

$$= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - (6a)$$

$$= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - 3ia\,\mathrm{s}$$

$$= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - 3ia\,\mathrm{s}$$

$$= -ia\sin^{-1}(ax)^3 - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{x} + 3a\sin^{-1}(ax)^2\log\left(1-e^{2i\sin^{-1}(ax)}\right) - 3ia\,\mathrm{s}$$

Mathematica [A]
time = 0.15, size = 108, normalized size = 1.09

$$\frac{1}{8}a\left(-i\pi^3 + 8i\text{ArcSin}(ax)^3 - \frac{8\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{ax} + 24\text{ArcSin}(ax)^2\log\left(1-e^{-2i\text{ArcSin}(ax)}\right) + 24i\text{ArcSin}(ax)\text{PolyLog}\left(2,e^{-2i\text{ArcSin}(ax)}\right) + 12\text{PolyLog}\left(3,e^{-2i\text{ArcSin}(ax)}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a*((-I)*Pi^3 + (8*I)*ArcSin[a*x]^3 - (8*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(
a*x) + 24*ArcSin[a*x]^2*Log[1 - E^((-2*I)*ArcSin[a*x])] + (24*I)*ArcSin[a*x
]*PolyLog[2, E^((-2*I)*ArcSin[a*x])] + 12*PolyLog[3, E^((-2*I)*ArcSin[a*x])
]))/8
```

Maple [A]
time = 0.23, size = 205, normalized size = 2.07

method	result
default	$\frac{\left(iax-\sqrt{-a^2x^2+1}\right)\arcsin(ax)^3}{x} - a\left(2i\arcsin(ax)^3 + 6i\arcsin(ax)\,\text{polylog}\left(2, -iax - \sqrt{-a^2x^2+1}\right.\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] (I*a*x-(-a^2*x^2+1)^(1/2))/x*arcsin(a*x)^3-a*(2*I*arcsin(a*x)^3+6*I*arcsin(
a*x)*polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))+6*I*arcsin(a*x)*polylog(2,I*a*x+(
```

```
-a^2*x^2+1)^(1/2))-3*arcsin(a*x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))-3*arcsin(
a*x)^2*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-6*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2)
)-6*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] (3*a^3*x*integrate(x*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^2, x) - sqr
t(a*x + 1)*sqrt(-a*x + 1)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^3)/x
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^4 - x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^3(ax)}{x^2\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/x**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**3/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{asin}(a\,x)^3}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(x^2*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^3/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.310 $\int \frac{\text{ArcSin}(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=264

$$-\frac{3a\text{ArcSin}(ax)^2}{2x}-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{2x^2}-6a^2\text{ArcSin}(ax)\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)-a^2\text{ArcSin}(ax)^3\tanh^{-1}\left(e^{i$$

```
[Out] -3/2*a*arcsin(a*x)^2/x-6*a^2*arcsin(a*x)*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))-
a^2*arcsin(a*x)^3*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+3*I*a^2*polylog(2,-I*a*
x-(-a^2*x^2+1)^(1/2))+3/2*I*a^2*arcsin(a*x)^2*polylog(2,-I*a*x-(-a^2*x^2+1)
^(1/2))-3*I*a^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-3/2*I*a^2*arcsin(a*x)^2
*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-3*a^2*arcsin(a*x)*polylog(3,-I*a*x-(-a
^2*x^2+1)^(1/2))+3*a^2*arcsin(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))-3*I*
a^2*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))+3*I*a^2*polylog(4,I*a*x+(-a^2*x^2+
1)^(1/2))-1/2*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.26, antiderivative size = 264, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {4789, 4803, 4268, 2611, 6744, 2320, 6724, 4723, 2317, 2438}

$$\frac{3}{2}ia^2\text{ArcSin}(ax)^2\text{Li}_2\left(-e^{i\text{ArcSin}(ax)}\right)-\frac{3}{2}ia^2\text{ArcSin}(ax)^2\text{Li}_2\left(e^{i\text{ArcSin}(ax)}\right)-3a^2\text{ArcSin}(ax)\text{Li}_3\left(-e^{i\text{ArcSin}(ax)}\right)+3a^2\text{ArcSin}(ax)\text{Li}_3\left(e^{i\text{ArcSin}(ax)}\right)+3ia^2\text{Li}_2\left(-e^{i\text{ArcSin}(ax)}\right)-3ia^2\text{Li}_2\left(e^{i\text{ArcSin}(ax)}\right)-3ia^2\text{Li}_4\left(-e^{i\text{ArcSin}(ax)}\right)+3ia^2\text{Li}_4\left(e^{i\text{ArcSin}(ax)}\right)-\frac{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^3}{2x^2}-a^2\text{ArcSin}(ax)^3\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)-6a^2\text{ArcSin}(ax)\tanh^{-1}\left(e^{i\text{ArcSin}(ax)}\right)-\frac{3a\text{ArcSin}(ax)^2}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^3/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-3*a*ArcSin[a*x]^2)/(2*x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(2*x^2) - 6*
a^2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcSin[a*x]^3*ArcTanh[E^(I
*ArcSin[a*x])] + (3*I)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] + ((3*I)/2)*a^2*A
rcSin[a*x]^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[2, E^(I*Arc
Sin[a*x])] - ((3*I)/2)*a^2*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] - 3*
a^2*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 3*a^2*ArcSin[a*x]*PolyLog[
3, E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[4, -E^(I*ArcSin[a*x])] + (3*I)*a^
2*PolyLog[4, E^(I*ArcSin[a*x])]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2x^2} + \frac{1}{2}(3a)\int \frac{\sin^{-1}(ax)^2}{x^2}\,dx + \frac{1}{2}a^2\int \frac{\sin^{-1}(ax)^3}{x\sqrt{1-a^2x^2}}\,dx$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2x^2} + \frac{1}{2}a^2\text{Subst}\left(\int x^3\csc(x)\,dx, x, \sin^{-1}(ax)\right.$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2x^2} - a^2\sin^{-1}(ax)^3\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - \frac{1}{2}($$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2$$

$$= -\frac{3a\sin^{-1}(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^3}{2x^2} - 6a^2\sin^{-1}(ax)\tanh^{-1}\left(e^{i\sin^{-1}(ax)}\right) - a^2$$

Mathematica [A]
time = 3.02, size = 317, normalized size = 1.20

$$\frac{1}{16}a^2\left(-i\pi^4 + 2i\text{ArcSin}(ax)^4 - 12\text{ArcSin}(ax)^2\cot\left(\frac{1}{2}\text{ArcSin}(ax)\right) - 2\text{ArcSin}(ax)^3\csc^2\left(\frac{1}{2}\text{ArcSin}(ax)\right) + 8\text{ArcSin}(ax)^3\log\left(1-e^{-i\text{ArcSin}(ax)}\right) + 48\text{ArcSin}(ax)\log\left(1-e^{i\text{ArcSin}(ax)}\right) - 48\text{ArcSin}(ax)\log\left(1+e^{i\text{ArcSin}(ax)}\right) - 8\text{ArcSin}(ax)^3\log\left(1+e^{i\text{ArcSin}(ax)}\right) + 24i\text{ArcSin}(ax)^2\text{PolyLog}\left(2,e^{-i\text{ArcSin}(ax)}\right) + 24i\left(2+\text{ArcSin}(ax)^2\right)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(ax)}\right) - 48i\text{PolyLog}\left(2,e^{i\text{ArcSin}(ax)}\right) + 48\text{ArcSin}(ax)\text{PolyLog}\left(3,e^{-i\text{ArcSin}(ax)}\right) - 48\text{ArcSin}(ax)\text{PolyLog}\left(3,-e^{i\text{ArcSin}(ax)}\right) - 48i\text{PolyLog}\left(4,e^{-i\text{ArcSin}(ax)}\right) - 48i\text{PolyLog}\left(4,-e^{i\text{ArcSin}(ax)}\right) + 2\text{ArcSin}(ax)^3\sec^2\left(\frac{1}{2}\text{ArcSin}(ax)\right) - 12\text{ArcSin}(ax)^2\tan\left(\frac{1}{2}\text{ArcSin}(ax)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^3/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*((-I)*Pi^4 + (2*I)*ArcSin[a*x]^4 - 12*ArcSin[a*x]^2*Cot[ArcSin[a*x]/2]
 - 2*ArcSin[a*x]^3*Csc[ArcSin[a*x]/2]^2 + 8*ArcSin[a*x]^3*Log[1 - E^((-I)*A
rcSin[a*x])] + 48*ArcSin[a*x]*Log[1 - E^(I*ArcSin[a*x])] - 48*ArcSin[a*x]*L
og[1 + E^(I*ArcSin[a*x])] - 8*ArcSin[a*x]^3*Log[1 + E^(I*ArcSin[a*x])] + (2
4*I)*ArcSin[a*x]^2*PolyLog[2, E^((-I)*ArcSin[a*x])] + (24*I)*(2 + ArcSin[a*
x]^2)*PolyLog[2, -E^(I*ArcSin[a*x])] - (48*I)*PolyLog[2, E^(I*ArcSin[a*x])]
 + 48*ArcSin[a*x]*PolyLog[3, E^((-I)*ArcSin[a*x])] - 48*ArcSin[a*x]*PolyLog
[3, -E^(I*ArcSin[a*x])] - (48*I)*PolyLog[4, E^((-I)*ArcSin[a*x])] - (48*I)*
PolyLog[4, -E^(I*ArcSin[a*x])] + 2*ArcSin[a*x]^3*Sec[ArcSin[a*x]/2]^2 - 12*
ArcSin[a*x]^2*Tan[ArcSin[a*x]/2]))/16
```

Maple [A]
time = 0.30, size = 399, normalized size = 1.51

method	result
default	$-\frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)^2\left(a^2x^2\arcsin(ax)-3ax\sqrt{-a^2x^2+1}-\arcsin(ax)\right)}{2(a^2x^2-1)x^2}+\frac{ia^2\left(i\arcsin(ax)^3\ln\left(1+iax+\sqrt{-a^2x \cdots\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*arcsin(a*x)^2*(a^2*x^2*arcsin(a*x)-
3*a*x*(-a^2*x^2+1)^(1/2)-arcsin(a*x))+1/2*I*a^2*(I*arcsin(a*x)^3*ln(1+I*a*x
+(-a^2*x^2+1)^(1/2))-I*arcsin(a*x)^3*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))+6*I*arc
sin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+6*I*arcsin(a*x)*polylog(3,-I*a*x-(-
a^2*x^2+1)^(1/2))-6*I*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-6*I*arcsin
(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))+3*arcsin(a*x)^2*polylog(2,-I*a*x-
(-a^2*x^2+1)^(1/2))-3*arcsin(a*x)^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))+6*p
olylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))-6*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))-
6*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))+6*polylog(4,I*a*x+(-a^2*x^2+1)^(1/2))
)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^5 - x^3), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^3(ax)}{x^3\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**3/x**3/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)**3/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{asin}(a\,x)^3}{x^3\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^3/(x^3*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^3/(x^3*(1 - a^2*x^2)^(1/2)), x)
```

3.311 $\int \frac{(c-a^2cx^2)^3}{\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=67

$$\frac{35c^3\text{CosIntegral}(\text{ArcSin}(ax))}{64a}+\frac{21c^3\text{CosIntegral}(3\text{ArcSin}(ax))}{64a}+\frac{7c^3\text{CosIntegral}(5\text{ArcSin}(ax))}{64a}+\frac{c^3\text{CosIntegra}$$

```
[Out] 35/64*c^3*Ci(arcsin(a*x))/a+21/64*c^3*Ci(3*arcsin(a*x))/a+7/64*c^3*Ci(5*arc
sin(a*x))/a+1/64*c^3*Ci(7*arcsin(a*x))/a
```

Rubi [A]
time = 0.08, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {4753, 3393, 3383}

$$\frac{35c^3\text{CosIntegral}(\text{ArcSin}(ax))}{64a}+\frac{21c^3\text{CosIntegral}(3\text{ArcSin}(ax))}{64a}+\frac{7c^3\text{CosIntegral}(5\text{ArcSin}(ax))}{64a}+\frac{c^3\text{CosIntegral}(7\text{ArcSin}(ax))}{64a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^3/ArcSin[a*x],x]
```

```
[Out] (35*c^3*CosIntegral[ArcSin[a*x]])/(64*a) + (21*c^3*CosIntegral[3*ArcSin[a*x
]])/(64*a) + (7*c^3*CosIntegral[5*ArcSin[a*x]])/(64*a) + (c^3*CosIntegral[7
*ArcSin[a*x]])/(64*a)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^3}{\sin^{-1}(ax)}\,dx = \frac{c^3\text{Subst}\left(\int \frac{\cos^7(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^3\text{Subst}\left(\int \left(\frac{35\cos(x)}{64x}+\frac{21\cos(3x)}{64x}+\frac{7\cos(5x)}{64x}+\frac{\cos(7x)}{64x}\right)\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^3\text{Subst}\left(\int \frac{\cos(7x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{64a}+\frac{(7c^3)\,\text{Subst}\left(\int \frac{\cos(5x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{64a}+\frac{(21c^3)}{}$$
$$= \frac{35c^3\text{Ci}(\sin^{-1}(ax))}{64a}+\frac{21c^3\text{Ci}(3\sin^{-1}(ax))}{64a}+\frac{7c^3\text{Ci}(5\sin^{-1}(ax))}{64a}+\frac{c^3\text{Ci}(7\sin^{-1}(ax))}{64a}$$

Mathematica [A]
time = 0.07, size = 43, normalized size = 0.64

$$\frac{c^3(35\text{CosIntegral}(\text{ArcSin}(ax))+21\text{CosIntegral}(3\text{ArcSin}(ax))+7\text{CosIntegral}(5\text{ArcSin}(ax))+\text{CosIntegral}(7\text{ArcSin}(ax)))}{64a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^3/ArcSin[a*x],x]
[Out] (c^3*(35*CosIntegral[ArcSin[a*x]] + 21*CosIntegral[3*ArcSin[a*x]] + 7*CosIn
tegral[5*ArcSin[a*x]] + CosIntegral[7*ArcSin[a*x]]))/(64*a)
```

Maple [A]
time = 0.11, size = 42, normalized size = 0.63

method	result
derivativedivides	$\frac{c^3(35\,\text{cosineIntegral}(\arcsin(ax))+21\,\text{cosineIntegral}(3\arcsin(ax))+7\,\text{cosineIntegral}(5\arcsin(ax))+\text{cosineIntegral}(7\,\text{arcsi}}{64a}$
default	$\frac{c^3(35\,\text{cosineIntegral}(\arcsin(ax))+21\,\text{cosineIntegral}(3\arcsin(ax))+7\,\text{cosineIntegral}(5\arcsin(ax))+\text{cosineIntegral}(7\,\text{arcsi}}{64a}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^3/arcsin(a*x),x,method=_RETURNVERBOSE)
[Out] 1/64/a*c^3*(35*Ci(arcsin(a*x))+21*Ci(3*arcsin(a*x))+7*Ci(5*arcsin(a*x))+Ci(
7*arcsin(a*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="maxima")
[Out] -integrate((a^2*c*x^2 - c)^3/arcsin(a*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="fricas")
[Out] integral(-(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)/arcsin(a*x),
x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-c^3\left(\int \frac{3a^2x^2}{\operatorname{asin}(ax)}\,dx + \int \left(-\frac{3a^4x^4}{\operatorname{asin}(ax)}\right)dx + \int \frac{a^6x^6}{\operatorname{asin}(ax)}\,dx + \int \left(-\frac{1}{\operatorname{asin}(ax)}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**3/asin(a*x),x)
[Out] -c**3*(Integral(3*a**2*x**2/asin(a*x), x) + Integral(-3*a**4*x**4/asin(a*x)
, x) + Integral(a**6*x**6/asin(a*x), x) + Integral(-1/asin(a*x), x))
```

Giac [A]
time = 0.46, size = 59, normalized size = 0.88

$$\frac{c^3\operatorname{Ci}(7\arcsin(ax))}{64a} + \frac{7c^3\operatorname{Ci}(5\arcsin(ax))}{64a} + \frac{21c^3\operatorname{Ci}(3\arcsin(ax))}{64a} + \frac{35c^3\operatorname{Ci}(\arcsin(ax))}{64a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="giac")
[Out] 1/64*c^3*cos_integral(7*arcsin(a*x))/a + 7/64*c^3*cos_integral(5*arcsin(a*x
))/a + 21/64*c^3*cos_integral(3*arcsin(a*x))/a + 35/64*c^3*cos_integral(arc
sin(a*x))/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(c-a^2\,c\,x^2\right)^3}{\operatorname{asin}(a\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^3/asin(a*x),x)
[Out] int((c - a^2*c*x^2)^3/asin(a*x), x)
```

3.312 $\int \frac{(c-a^2cx^2)^2}{\mathbf{ArcSin}(ax)} dx$

Optimal. Leaf size=50

$$\frac{5c^2\text{CosIntegral}(\text{ArcSin}(ax))}{8a}+\frac{5c^2\text{CosIntegral}(3\text{ArcSin}(ax))}{16a}+\frac{c^2\text{CosIntegral}(5\text{ArcSin}(ax))}{16a}$$

```
[Out] 5/8*c^2*Ci(arcsin(a*x))/a+5/16*c^2*Ci(3*arcsin(a*x))/a+1/16*c^2*Ci(5*arcsin
(a*x))/a
```

Rubi [A]
time = 0.07, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {4753, 3393, 3383}

$$\frac{5c^2\text{CosIntegral}(\text{ArcSin}(ax))}{8a}+\frac{5c^2\text{CosIntegral}(3\text{ArcSin}(ax))}{16a}+\frac{c^2\text{CosIntegral}(5\text{ArcSin}(ax))}{16a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^2/ArcSin[a*x],x]
```

```
[Out] (5*c^2*CosIntegral[ArcSin[a*x]])/(8*a) + (5*c^2*CosIntegral[3*ArcSin[a*x]])
/(16*a) + (c^2*CosIntegral[5*ArcSin[a*x]])/(16*a)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^2}{\sin^{-1}(ax)}\,dx = \frac{c^2\text{Subst}\left(\int \frac{\cos^5(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^2\text{Subst}\left(\int \left(\frac{5\cos(x)}{8x}+\frac{5\cos(3x)}{16x}+\frac{\cos(5x)}{16x}\right)\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c^2\text{Subst}\left(\int \frac{\cos(5x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{16a} + \frac{(5c^2)\,\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{16a} + \frac{(5c^2)\,\text{Su}}{}$$
$$= \frac{5c^2\text{Ci}(\sin^{-1}(ax))}{8a} + \frac{5c^2\text{Ci}(3\sin^{-1}(ax))}{16a} + \frac{c^2\text{Ci}(5\sin^{-1}(ax))}{16a}$$

Mathematica [A]
time = 0.05, size = 34, normalized size = 0.68

$$\frac{c^2(10\text{CosIntegral}(\text{ArcSin}(ax)) + 5\text{CosIntegral}(3\text{ArcSin}(ax)) + \text{CosIntegral}(5\text{ArcSin}(ax)))}{16a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^2/ArcSin[a*x],x]
[Out] (c^2*(10*CosIntegral[ArcSin[a*x]] + 5*CosIntegral[3*ArcSin[a*x]] + CosInteg
ral[5*ArcSin[a*x]]))/(16*a)
```

Maple [A]
time = 0.10, size = 33, normalized size = 0.66

method	result	size
derivativedivides	$\frac{c^2(10\,\text{cosineIntegral}(\arcsin(ax))+5\,\text{cosineIntegral}(3\arcsin(ax))+\text{cosineIntegral}(5\arcsin(ax)))}{16a}$	33
default	$\frac{c^2(10\,\text{cosineIntegral}(\arcsin(ax))+5\,\text{cosineIntegral}(3\arcsin(ax))+\text{cosineIntegral}(5\arcsin(ax)))}{16a}$	33

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^2/arcsin(a*x),x,method=_RETURNVERBOSE)
[Out] 1/16/a*c^2*(10*Ci(arcsin(a*x))+5*Ci(3*arcsin(a*x))+Ci(5*arcsin(a*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 - c)^2/arcsin(a*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)/arcsin(a*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int\left(-\frac{2a^2x^2}{\operatorname{asin}(ax)}\right)dx+\int\frac{a^4x^4}{\operatorname{asin}(ax)}\,dx+\int\frac{1}{\operatorname{asin}(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**2/asin(a*x),x)
[Out] c**2*(Integral(-2*a**2*x**2/asin(a*x), x) + Integral(a**4*x**4/asin(a*x), x
) + Integral(1/asin(a*x), x))
```

Giac [A]
time = 0.46, size = 44, normalized size = 0.88

$$\frac{c^2\operatorname{Ci}(5\arcsin(ax))}{16a}+\frac{5c^2\operatorname{Ci}(3\arcsin(ax))}{16a}+\frac{5c^2\operatorname{Ci}(\arcsin(ax))}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="giac")
[Out] 1/16*c^2*cos_integral(5*arcsin(a*x))/a + 5/16*c^2*cos_integral(3*arcsin(a*x
))/a + 5/8*c^2*cos_integral(arcsin(a*x))/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{(c-a^2\,c\,x^2)^2}{\operatorname{asin}(a\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^2/asin(a*x),x)
[Out] int((c - a^2*c*x^2)^2/asin(a*x), x)
```

3.313 $\int \frac{c-a^2cx^2}{\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=29

$$\frac{3c\text{CosIntegral}(\text{ArcSin}(ax))}{4a}+\frac{c\text{CosIntegral}(3\text{ArcSin}(ax))}{4a}$$

```
[Out] 3/4*c*Ci(arcsin(a*x))/a+1/4*c*Ci(3*arcsin(a*x))/a
```

Rubi [A]
time = 0.05, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4753, 3393, 3383}

$$\frac{3c\text{CosIntegral}(\text{ArcSin}(ax))}{4a}+\frac{c\text{CosIntegral}(3\text{ArcSin}(ax))}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)/ArcSin[a*x],x]
```

```
[Out] (3*c*CosIntegral[ArcSin[a*x]])/(4*a) + (c*CosIntegral[3*ArcSin[a*x]])/(4*a)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \frac{c-a^2cx^2}{\sin^{-1}(ax)}\,dx = \frac{c\text{Subst}\left(\int \frac{\cos^3(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c\text{Subst}\left(\int \left(\frac{3\cos(x)}{4x}+\frac{\cos(3x)}{4x}\right)\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= \frac{c\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{4a} + \frac{(3c)\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{4a}$$
$$= \frac{3c\text{Ci}(\sin^{-1}(ax))}{4a} + \frac{c\text{Ci}(3\sin^{-1}(ax))}{4a}$$

Mathematica [**A**]
time = 0.02, size = 23, normalized size = 0.79

$$\frac{c(3\text{CosIntegral}(\text{ArcSin}(ax)) + \text{CosIntegral}(3\text{ArcSin}(ax)))}{4a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)/ArcSin[a*x],x]
[Out] (c*(3*CosIntegral[ArcSin[a*x]] + CosIntegral[3*ArcSin[a*x]]))/(4*a)
```

Maple [**A**]
time = 0.04, size = 22, normalized size = 0.76

method	result	size
derivativedivides	$\frac{c(3\,\text{cosineIntegral}(\arcsin(ax))+\text{cosineIntegral}(3\arcsin(ax)))}{4a}$	22
default	$\frac{c(3\,\text{cosineIntegral}(\arcsin(ax))+\text{cosineIntegral}(3\arcsin(ax)))}{4a}$	22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)/arcsin(a*x),x,method=_RETURNVERBOSE)
[Out] 1/4/a*c*(3*Ci(arcsin(a*x))+Ci(3*arcsin(a*x)))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="maxima")
```

[Out] -integrate((a^2*c*x^2 - c)/arcsin(a*x), x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="fricas")

[Out] integral(-(a^2*c*x^2 - c)/arcsin(a*x), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-c\left(\int \frac{a^2x^2}{\operatorname{asin}(ax)}\,dx + \int \left(-\frac{1}{\operatorname{asin}(ax)}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-a**2*c*x**2+c)/asin(a*x),x)

[Out] -c*(Integral(a**2*x**2/asin(a*x), x) + Integral(-1/asin(a*x), x))

Giac [A]
time = 0.42, size = 25, normalized size = 0.86

$$\frac{c\operatorname{Ci}(3\arcsin(ax))}{4a} + \frac{3c\operatorname{Ci}(\arcsin(ax))}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="giac")

[Out] 1/4*c*cos_integral(3*arcsin(a*x))/a + 3/4*c*cos_integral(arcsin(a*x))/a

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{c-a^2\,c\,x^2}{\operatorname{asin}(a\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c - a^2*c*x^2)/asin(a*x),x)

[Out] int((c - a^2*c*x^2)/asin(a*x), x)

3.314 $\int \frac{1}{(c-a^2cx^2)\text{ArcSin}(ax)} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{(c-a^2cx^2)\,\text{ArcSin}(ax)},x\right)$$

```
[Out] Unintegrable(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)*ArcSin[a*x]),x]
[Out] Defer[Int][1/((c - a^2*c*x^2)*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)}\,dx = \int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)}\,dx$$

Mathematica [A]
time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{1}{(c-a^2cx^2)\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]),x]
[Out] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]), x]
```

Maple [A]
time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{1}{(-a^2c\,x^2+c)\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
[Out] int(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="maxima")
[Out] -integrate(1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="fricas")
[Out] integral(-1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{a^{2}x^{2}\operatorname{asin}{\left(ax \right)}-\operatorname{asin}{\left(ax \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)/asin(a*x),x)
[Out] -Integral(1/(a**2*x**2*asin(a*x) - asin(a*x)), x)/c
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="giac")
[Out] integrate(-1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\mathrm{asin}\left(a\,x\right)\,\left(c-a^2\,c\,x^2\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)*(c - a^2*c*x^2)),x)
[Out] int(1/(asin(a*x)*(c - a^2*c*x^2)), x)
```

3.315 $\int \frac{1}{(c-a^2cx^2)^2\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{(c-a^2cx^2)^2\,\text{ArcSin}(ax)},x\right)$$

```
[Out] Unintegrable(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^2\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^2*ArcSin[a*x]),x]
```

```
[Out] Defer[Int][1/((c - a^2*c*x^2)^2*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)^2\sin^{-1}(ax)}\,dx = \int \frac{1}{(c-a^2cx^2)^2\sin^{-1}(ax)}\,dx$$

Mathematica [A]
time = 5.36, size = 0, normalized size = 0.00

$$\int \frac{1}{(c-a^2cx^2)^2\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]), x]
```

Maple [A]
time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{1}{(-a^2c\,x^2+c)^2\arcsin(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="fricas")
```

```
[Out] integral(1/((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*arcsin(a*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^4\operatorname{asin}(ax)-2a^2x^2\operatorname{asin}(ax)+\operatorname{asin}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**2/asin(a*x),x)
```

```
[Out] Integral(1/(a**4*x**4*asin(a*x) - 2*a**2*x**2*asin(a*x) + asin(a*x)), x)/c*
*2
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\operatorname{asin}(a\,x)\,\left(c-a^2\,c\,x^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)*(c - a^2*c*x^2)^2),x)
```

```
[Out] int(1/(asin(a*x)*(c - a^2*c*x^2)^2), x)
```

3.316 $\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\textbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=206

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^5}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^5}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(6\right.}{32bc^5}$$

```
[Out] -1/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^5-1/16*Ci(4*(a+b*arcsin(c*x)
)/b)*cos(4*a/b)/b/c^5+1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c^5+1/16*
ln(a+b*arcsin(c*x))/b/c^5-1/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^5-1
/16*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^5+1/32*Si(6*(a+b*arcsin(c*x))/
b)*sin(6*a/b)/b/c^5
```

Rubi [A]
time = 0.29, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^5}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^5}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^5}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^5}-\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^5}+\frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^5}+\frac{\log(a+b\text{ArcSin}(cx))}{16bc^5}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/32*(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b*c^5) - (Cos[
(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (Cos[(6*a)/b]
*CosIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^5) + Log[a + b*ArcSin[c*x]
]/(16*b*c^5) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*
c^5) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (
Sin[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^4(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^5}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{16(a+bx)} - \frac{\cos(2x)}{32(a+bx)} - \frac{\cos(4x)}{16(a+bx)} + \frac{\cos(6x)}{32(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^5}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^5} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^5} + \frac{\text{Subst}\left(\int \frac{\cos(6x)}{a+bx}\,dx, x, \sin\right.}{32c^5}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^5} - \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subs}}{}$$
$$= -\frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc^5} + \frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}+\right.}{32bc^5}$$

Mathematica [A]
time = 0.29, size = 152, normalized size = 0.74

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+2\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-2\log(a+b\text{ArcSin}(cx))+\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+2\sin\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\sin\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{32bc^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/32*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 2*Cos[(4*a)/b]*Cos
Integral[4*(a/b + ArcSin[c*x])] - Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[
c*x])] - 2*Log[a + b*ArcSin[c*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSi
n[c*x])] + 2*Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] - Sin[(6*a)/b]
*SinIntegral[6*(a/b + ArcSin[c*x])])/(b*c^5)
```

Maple [A]
time = 0.12, size = 157, normalized size = 0.76

method	result
default	$\frac{\mathrm{sinIntegral}\left(6 \arcsin(cx)+\frac{6a}{b}\right) \sin\left(\frac{6a}{b}\right)+\mathrm{cosineIntegral}\left(6 \arcsin(cx)+\frac{6a}{b}\right) \cos\left(\frac{6a}{b}\right)-2\,\mathrm{sinIntegral}\left(4 \arcsin(cx)+\frac{4a}{b}\right) \sin\left(\frac{4a}{b}\right)-2\,\mathrm{cosineI}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/c^5*(Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+Ci(6*arcsin(c*x)+6*a/b)*cos(6*
a/b)-2*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)-2*Ci(4*arcsin(c*x)+4*a/b)*cos(4*a
/b)-Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)+2
*ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^4/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^4/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4 \sqrt{-(cx-1)(cx+1)}}{a+b \operatorname{asin}(cx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**4*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 472 vs. 2(192) = 384.
time = 0.45, size = 472, normalized size = 2.29

$$\frac{\cos\left(\frac{a}{b}\right)^{6} \operatorname{Ci}\left(\frac{6a}{b}+6 \arcsin\left(cx\right)\right)}{bc^{5}}+\frac{\cos\left(\frac{a}{b}\right)^{5} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6 \arcsin\left(cx\right)\right)}{bc^{5}}-\frac{3 \cos\left(\frac{a}{b}\right)^{4} \operatorname{Ci}\left(\frac{6a}{b}+6 \arcsin\left(cx\right)\right)}{2bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)^{4} \operatorname{Ci}\left(\frac{4a}{b}+4 \arcsin\left(cx\right)\right)}{2bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)^{3} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6 \arcsin\left(cx\right)\right)}{bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)^{3} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4 \arcsin\left(cx\right)\right)}{2bc^{5}}+\frac{9 \cos\left(\frac{a}{b}\right)^{2} \operatorname{Ci}\left(\frac{6a}{b}+6 \arcsin\left(cx\right)\right)}{16bc^{5}}+\frac{\cos\left(\frac{a}{b}\right)^{2} \operatorname{Ci}\left(\frac{4a}{b}+4 \arcsin\left(cx\right)\right)}{2bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)^{2} \operatorname{Ci}\left(\frac{2a}{b}+2 \arcsin\left(cx\right)\right)}{16bc^{5}}+\frac{3 \cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6 \arcsin\left(cx\right)\right)}{16bc^{5}}+\frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4 \arcsin\left(cx\right)\right)}{4bc^{5}}-\frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{2a}{b}+2 \arcsin\left(cx\right)\right)}{16bc^{5}}-\frac{\operatorname{Ci}\left(\frac{6a}{b}+6 \arcsin\left(cx\right)\right)}{32bc^{5}}-\frac{\operatorname{Ci}\left(\frac{4a}{b}+4 \arcsin\left(cx\right)\right)}{16bc^{5}}+\frac{\operatorname{Ci}\left(\frac{2a}{b}+2 \arcsin\left(cx\right)\right)}{32bc^{5}}+\frac{\log\left(b \arcsin\left(cx\right)+a\right)}{16bc^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) + cos(a/b)^5*sin(a/b
)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) - 3/2*cos(a/b)^4*cos_integral
(6*a/b + 6*arcsin(c*x))/(b*c^5) - 1/2*cos(a/b)^4*cos_integral(4*a/b + 4*arc
sin(c*x))/(b*c^5) - cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))
/(b*c^5) - 1/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c
^5) + 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) + 1/2*cos
(a/b)^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) - 1/16*cos(a/b)^2*cos_i
ntegral(2*a/b + 2*arcsin(c*x))/(b*c^5) + 3/16*cos(a/b)*sin(a/b)*sin_integra
l(6*a/b + 6*arcsin(c*x))/(b*c^5) + 1/4*cos(a/b)*sin(a/b)*sin_integral(4*a/b
 + 4*arcsin(c*x))/(b*c^5) - 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^5) - 1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) - 1/
16*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + 1/32*cos_integral(2*a/b +
2*arcsin(c*x))/(b*c^5) + 1/16*log(b*arcsin(c*x) + a)/(b*c^5)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^4*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.317 $\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=183

$$-\frac{\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^4}-\frac{\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^4}+\frac{\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(c\ldots}{b}\right.}{16bc^4}$$

```
[Out] 1/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4+1/16*cos(3*a/b)*Si(3*(a+b*arcsin
(c*x))/b)/b/c^4-1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^4-1/8*Ci((a+b
*arcsin(c*x))/b)*sin(a/b)/b/c^4-1/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b
/c^4+1/16*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^4
```

Rubi [A]
time = 0.29, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^4}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^4}+\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^4}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^4}+\frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^4}-\frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/8*(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^4) - (CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^4) + (CosIntegral[(5*(a + b
*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^4) + (Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(8*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]
))/b])/(16*b*c^4) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(
16*b*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^3(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{c^4}\\
&= \frac{\text{Subst}\left(\int \left(\frac{\sin(x)}{8(a+bx)}+\frac{\sin(3x)}{16(a+bx)}-\frac{\sin(5x)}{16(a+bx)}\right)\,dx,x,\sin^{-1}(cx)\right)}{c^4}\\
&= \frac{\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{16c^4}-\frac{\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{16c^4}+\frac{\text{Subst}\left(\int \frac{\sin(x}{a+bx}\right.}{}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{8c^4}+\frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx,x,\sin^{-1}(\right.}{16c^4}\\
&= -\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^4}-\frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16bc^4}+\frac{\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)}{16bc^4}\end{aligned}$$

Mathematica [A]
time = 0.23, size = 135, normalized size = 0.74

$$\frac{-2\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)+\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{5a}{b}\right)+2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\cos\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16bc^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcSin[c
*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + 2*Co
```

```
s[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/b]*SinIntegral[3*(a/b + A
rcSin[c*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*c^4)
```

Maple [A]
time = 0.09, size = 138, normalized size = 0.75

method	result
default	$-\frac{2\,\mathrm{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\mathrm{cosineIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-\mathrm{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-2\,\mathrm{sinIn}}{16c^4b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] -1/16/c^4*(2*Ci(arcsin(c*x)+a/b)*sin(a/b)+Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b
)-Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-2*Si(arcsin(c*x)+a/b)*cos(a/b)+Si(5*ar
csin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^3/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\sqrt{-(cx-1)(cx+1)}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.318 $\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=82

$$-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc^3}+\frac{\log(a+b\text{ArcSin}(cx))}{8bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc^3}$$

```
[Out] -1/8*Ci(4*(a+b*arcsin(c*x))/b)*cos(4*a/b)/b/c^3+1/8*ln(a+b*arcsin(c*x))/b/c
^3-1/8*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^3
```

Rubi [A]
time = 0.16, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc^3}+\frac{\log(a+b\text{ArcSin}(cx))}{8bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/8*(Cos[(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(b*c^3) + Log[a
+ b*ArcSin[c*x]]/(8*b*c^3) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x
]))/b])/(8*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3} \\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{8(a+bx)} - \frac{\cos(4x)}{8(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c^3} \\
&= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3} - \frac{\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^3} \\
&= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}+4x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Subs}}{} \\
&= -\frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^3} + \frac{\log\left(a+b\sin^{-1}(cx)\right)}{8bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\sin^{-1}(cx\right.}{8bc^3}
\end{aligned}$$

Mathematica [A]
time = 0.14, size = 66, normalized size = 0.80

$$-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) - \log(8(a+b\text{ArcSin}(cx))) + \sin\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{8bc^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
[Out] -1/8*(Cos[(4*a)/b]*CosIntegral[4*(a/b + ArcSin[c*x])] - Log[8*(a + b*ArcSin
[c*x])] + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])])/(b*c^3)
```

Maple [A]
time = 0.10, size = 65, normalized size = 0.79

method	result	size
default	$-\frac{\mathrm{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+\mathrm{cosineIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\ln(a+b\arcsin(cx))}{8c^3b}$	65

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c^3*(Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+Ci(4*arcsin(c*x)+4*a/b)*cos(4*
a/b)-ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^2/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\sqrt{-(cx-1)(cx+1)}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 169 vs. 2(76) = 152.
time = 0.46, size = 169, normalized size = 2.06

$$-\frac{\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^3}-\frac{\cos\left(\frac{a}{b}\right)^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^3}+\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc^3}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2\,bc^3}-\frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8\,bc^3}+\frac{\log\left(b\arcsin(cx)+a\right)}{8\,bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) - cos(a/b)^3*sin(a/
b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + cos(a/b)^2*cos_integral(4*
a/b + 4*arcsin(c*x))/(b*c^3) + 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4
*arcsin(c*x))/(b*c^3) - 1/8*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1
/8*log(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.319 $\int \frac{x\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=121

$$-\frac{\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4bc^2}-\frac{\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^2}$$

```
[Out] 1/4*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2+1/4*cos(3*a/b)*Si(3*(a+b*arcsin(
c*x))/b)/b/c^2-1/4*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^2-1/4*Ci(3*(a+b*arc
sin(c*x))/b)*sin(3*a/b)/b/c^2
```

Rubi [A]
time = 0.18, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^2}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^2}+\frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4bc^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^2) - (CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b*c^2) + (Cos[a/b]*SinIntegral[(
a + b*ArcSin[c*x])/b])/(4*b*c^2) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcS
in[c*x]))/b])/(4*b*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{c^2}\\ &= \frac{\text{Subst}\left(\int \left(\frac{\sin(x)}{4(a+bx)}+\frac{\sin(3x)}{4(a+bx)}\right)\,dx,x,\sin^{-1}(cx)\right)}{c^2}\\ &= \frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4c^2}+\frac{\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4c^2}\\ &= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4c^2}+\frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx,x,\sin^{-1}(\right.}{4c^2}\\ &= -\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^2}-\frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{4bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(\right.}{4bc^2}\end{aligned}$$

Mathematica [A]
time = 0.15, size = 91, normalized size = 0.75

$$\frac{-\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)+\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{4bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b]) - CosIntegral[3*(a/b + ArcSin[c
*x])]*Sin[(3*a)/b] + Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/b]
*SinIntegral[3*(a/b + ArcSin[c*x])])/(4*b*c^2)
```

Maple [A]
time = 0.09, size = 92, normalized size = 0.76

method	result
default	$\frac{\mathrm{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-\mathrm{cosineIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)+\mathrm{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\mathrm{cosineIntegra}}{4c^2b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/4/c^2*(Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-Ci(3*arcsin(c*x)+3*a/b)*sin(3*a
/b)+Si(arcsin(c*x)+a/b)*cos(a/b)-Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)*x/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{a+b\,\mathrm{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [A]
time = 0.44, size = 172, normalized size = 1.42

$$-\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^{2}}+\frac{\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{bc^{2}}+\frac{\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{2}}-\frac{\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{2}}-\frac{3\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{4bc^{2}}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{4bc^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/4*cos_integral(3*a/b + 3
*arcsin(c*x))*sin(a/b)/(b*c^2) - 1/4*cos_integral(a/b + arcsin(c*x))*sin(a/
b)/(b*c^2) - 3/4*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/4
*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\,\mathrm{asin}\,(c\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.320 $\int \frac{\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=82

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc}+\frac{\log(a+b\text{ArcSin}(cx))}{2bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc}$$

```
[Out] 1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c+1/2*ln(a+b*arcsin(c*x))/b/c+1/
2*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c
```

Rubi [A]
time = 0.10, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4753, 3393, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc}+\frac{\log(a+b\text{ArcSin}(cx))}{2bc}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c) + Log[a + b*A
rcSin[c*x]]/(2*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])
/(2*b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{2(a+bx)}+\frac{\cos(2x)}{2(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c}$$
$$= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c}+\frac{\sin\left(\frac{2a}{b}\right)\text{Subs}}{}$$
$$= \frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}$$

Mathematica [A]
time = 0.11, size = 62, normalized size = 0.76

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\log(a+b\text{ArcSin}(cx))+\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{2bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x]),x]
[Out] (Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Log[a + b*ArcSin[c*x]] +
 Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(2*b*c)
```

Maple [A]
time = 0.10, size = 63, normalized size = 0.77

method	result	size

default	$\frac{\text{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)+\text{cosineIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+\ln(a+b\arcsin(cx))}{2cb}$	63

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c*(Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b
)+ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [A]
time = 0.44, size = 102, normalized size = 1.24

$$\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc}-\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc}+\frac{\log(b\arcsin(cx)+a)}{2bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c) + cos(a/b)*sin(a/b)*si
n_integral(2*a/b + 2*arcsin(c*x))/(b*c) - 1/2*cos_integral(2*a/b + 2*arcsin
(c*x))/(b*c) + 1/2*log(b*arcsin(c*x) + a)/(b*c)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x)),x)
```

```
[Out] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x)), x)
```

3.321 $\int \frac{\sqrt{1-c^2x^2}}{x(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=79

$$\frac{\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b}+\text{Int}\left(\frac{1}{x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))},x\right)$$

[Out] -cos(a/b)*Si((a+b*arcsin(c*x))/b)/b+Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b+Unintegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)

Rubi [A]
time = 0.27, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

[In] Int[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])),x]

[Out] (CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/b - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/b + Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx &= \int \left(\frac{1}{x\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}-\frac{c^2x}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}\right)dx\\
&= -\left(c^2\int \frac{x}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}\,dx\right)+\int \frac{1}{x\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}\\
&= \int \frac{1}{x\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}\,dx-\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)\\
&= -\left(\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos}{a}\right.\\
&= \frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b}+\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b}
\end{aligned}$$

Mathematica [A]
time = 2.06, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^2x^2+1}}{x\,(a+b\arcsin\left(cx\right))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x*arcsin(c*x) + a*x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x\,(a+b\,\text{asin}\left(cx\right))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{1-c^2\,x^2}}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))),x)
```

```
[Out] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))), x)
```

3.322 $\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=47

$$-\frac{c\log(a+b\text{ArcSin}(cx))}{b}+\text{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] -c*ln(a+b*arcsin(c*x))/b+Unintegrable(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^
(1/2),x)
```

Rubi [A]
time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((c*Log[a + b*ArcSin[c*x]])/b) + Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{x^2\,(a+b\sin^{-1}(cx))}\,dx &= \int \left(-\frac{c^2}{\sqrt{1-c^2x^2}\,\,(a+b\sin^{-1}(cx))}+\frac{1}{x^2\sqrt{1-c^2x^2}\,\,(a+b\sin^{-1}(cx))}\right)dx\\
&= -\left(c^2\int \frac{1}{\sqrt{1-c^2x^2}\,\,(a+b\sin^{-1}(cx))}\,dx\right)+\int \frac{1}{x^2\sqrt{1-c^2x^2}\,\,(a+b\sin^{-1}(cx))}\\
&= -\frac{c\log\left(a+b\sin^{-1}(cx)\right)}{b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}\,\,(a+b\sin^{-1}(cx))}\,dx
\end{aligned}$$

Mathematica [A]
time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^{2} x^{2}+1}}{x^{2} \left(a +b \arcsin \left(c x \right)\right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{- \left(c x - 1\right) \left(c x + 1\right)}}{x^{2} \left(a + b \operatorname{asin}{\left(c x \right)}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**2/(a+b*asin(c*x)),x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**2*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{1-c^2\,x^2}}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))), x)
```

3.323 $\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 3.71, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 2.32, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^2x^2+1}}{x^3\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^3), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^3*arcsin(c*x) + a*x^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-(cx-1)(cx+1)}}{x^3(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**3/(a+b*asin(c*x)),x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**3*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{1-c^2\,x^2}}{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))), x)
```

3.324 $\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 0.54, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 3.29, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^2x^2+1}}{x^4\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^4), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^4*arcsin(c*x) + a*x^4), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x^{4}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**4/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**4*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^4), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{1-c^2\,x^2}}{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))), x)
```

3.325 $\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\textbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=245

$$-\frac{3\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{64bc^4}-\frac{3\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{64bc^4}+\frac{\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}}{b}\right.}{64bc^4}$$

```
[Out] 3/64*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4+3/64*cos(3*a/b)*Si(3*(a+b*arcsi
n(c*x))/b)/b/c^4-1/64*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^4-1/64*cos(7
*a/b)*Si(7*(a+b*arcsin(c*x))/b)/b/c^4-3/64*Ci((a+b*arcsin(c*x))/b)*sin(a/b)
/b/c^4-3/64*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^4+1/64*Ci(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b/c^4+1/64*Ci(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b/c^4
```

Rubi [A]
time = 0.33, antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64bc^4}-\frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^4}+\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^4}+\frac{\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^4}+\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64bc^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^4}-\frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^4}-\frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(64*b*c^4) - (3*CosIntegra
l[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(64*b*c^4) + (CosIntegral[(5*(a
+ b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(64*b*c^4) + (CosIntegral[(7*(a + b*ArcS
in[c*x]))/b]*Sin[(7*a)/b])/(64*b*c^4) + (3*Cos[a/b]*SinIntegral[(a + b*ArcS
in[c*x])/b])/(64*b*c^4) + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]
))/b])/(64*b*c^4) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(
64*b*c^4) - (Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b*c^4
)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos^4(x)\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^4} \\
&= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{64(a+bx)}+\frac{3\sin(3x)}{64(a+bx)}-\frac{\sin(5x)}{64(a+bx)}-\frac{\sin(7x)}{64(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c^4} \\
&= -\frac{\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^4}-\frac{\text{Subst}\left(\int \frac{\sin(7x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^4}+\frac{3\text{Subst}\left(\int \frac{\text{s}}{}\right.}{} \\
&= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64c^4}+\frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx,\right.}{64c^4} \\
&= -\frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^4}-\frac{3\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{64bc^4}+\frac{\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx\right.}{64bc^4}
\end{aligned}$$

Mathematica [A]
time = 0.53, size = 179, normalized size = 0.73

$$\frac{-3\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-3\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)+\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{5a}{b}\right)+\text{CosIntegral}\left(7\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{7a}{b}\right)+3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+3\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\cos\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\cos\left(\frac{7a}{b}\right)\text{Si}\left(7\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{64bc^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + Co
sIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] + 3*Cos[a/b]*SinIntegral[a/b
+ ArcSin[c*x]] + 3*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - Cos[(5
*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] - Cos[(7*a)/b]*SinIntegral[7*(a/b
 + ArcSin[c*x])])/(64*b*c^4)
```

Maple [A]
time = 0.10, size = 184, normalized size = 0.75

method	result
default	$-\frac{\mathrm{sinIntegral}\left(7\arcsin(cx)+\frac{7a}{b}\right)\cos\left(\frac{7a}{b}\right)-\mathrm{cosineIntegral}\left(7\arcsin(cx)+\frac{7a}{b}\right)\sin\left(\frac{7a}{b}\right)-3\,\mathrm{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)+3\,\mathrm{cosineI}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/64/c^4*(Si(7*arcsin(c*x)+7*a/b)*cos(7*a/b)-Ci(7*arcsin(c*x)+7*a/b)*sin(7
*a/b)-3*Si(arcsin(c*x)+a/b)*cos(a/b)+3*Ci(arcsin(c*x)+a/b)*sin(a/b)+Si(5*ar
csin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)-3*Si(3*arcsi
n(c*x)+3*a/b)*cos(3*a/b)+3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^3/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^5 - x^3)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(-(cx-1)(cx+1))^{\frac{3}{2}}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 614 vs. 2(229) = 458.
time = 0.46, size = 614, normalized size = 2.51

$$\frac{\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^{4}}-\frac{\cos\left(\frac{a}{b}\right)^{7}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{bc^{4}}-\frac{5\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{4}}+\frac{\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{4}}+\frac{7\cos\left(\frac{a}{b}\right)^{5}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{4bc^{4}}-\frac{\cos\left(\frac{a}{b}\right)^{5}\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{4bc^{4}}+\frac{3\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{8bc^{4}}-\frac{3\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{4}}-\frac{3\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{4}}-\frac{7\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{8bc^{4}}+\frac{5\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{16bc^{4}}+\frac{3\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{16bc^{4}}-\frac{\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{4}}+\frac{\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{4}}+\frac{3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{4}}-\frac{3\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{4}}+\frac{7\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{64bc^{4}}-\frac{5\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{64bc^{4}}-\frac{9\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{64bc^{4}}+\frac{3\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{64bc^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^
7*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 5/4*cos(a/b)^4*cos_integral
(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 1/4*cos(a/b)^4*cos_integral(5*a/
b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) + 7/4*cos(a/b)^5*sin_integral(7*a/b + 7
*arcsin(c*x))/(b*c^4) - 1/4*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))/
(b*c^4) + 3/8*cos(a/b)^2*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^
4) - 3/16*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) -
 3/16*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 7/8
*cos(a/b)^3*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) + 5/16*cos(a/b)^3*s
in_integral(5*a/b + 5*arcsin(c*x))/(b*c^4) + 3/16*cos(a/b)^3*sin_integral(3
*a/b + 3*arcsin(c*x))/(b*c^4) - 1/64*cos_integral(7*a/b + 7*arcsin(c*x))*si
n(a/b)/(b*c^4) + 1/64*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4)
+ 3/64*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/64*cos_inte
gral(a/b + arcsin(c*x))*sin(a/b)/(b*c^4) + 7/64*cos(a/b)*sin_integral(7*a/b
 + 7*arcsin(c*x))/(b*c^4) - 5/64*cos(a/b)*sin_integral(5*a/b + 5*arcsin(c*x
))/(b*c^4) - 9/64*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 3/
64*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^4)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(1-c^2\,x^2\right)}^{3/2}}{a+b\,\mathrm{asin}\left(c\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.326 $\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=206

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a-}{}\right.}{32bc^3}$$

```
[Out] 1/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^3-1/16*Ci(4*(a+b*arcsin(c*x))
/b)*cos(4*a/b)/b/c^3-1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c^3+1/16*l
n(a+b*arcsin(c*x))/b/c^3+1/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^3-1/
16*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^3-1/32*Si(6*(a+b*arcsin(c*x))/b
)*sin(6*a/b)/b/c^3
```

Rubi [A]
time = 0.26, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^3}-\frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}+\frac{\log(a+b\text{ArcSin}(cx))}{16bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(4*
a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^3) - (Cos[(6*a)/b]*Co
sIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) + Log[a + b*ArcSin[c*x]]/(
16*b*c^3) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3
) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^3) - (Sin
[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos^4(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{16(a+bx)}+\frac{\cos(2x)}{32(a+bx)}-\frac{\cos(4x)}{16(a+bx)}-\frac{\cos(6x)}{32(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c^3}\\
&= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^3}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3}-\frac{\text{Subst}\left(\int \frac{\cos(6x)}{a+bx}\,dx, x, \sin\right.}{32c^3}\\
&= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{16bc^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{Subs}}{}\\
&= \frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}+6\,\text{s}\right.}{32bc^3}
\end{aligned}$$

Mathematica [A]

time = 0.42, size = 165, normalized size = 0.80

$$-\frac{-\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+2\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+2\log(a+b\text{ArcSin}(cx))-4\log(8(a+b\text{ArcSin}(cx)))-\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+2\sin\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\sin\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{32bc^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

[Out] -1/32*(-(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])]) + 2*Cos[(4*a)/b]*
CosIntegral[4*(a/b + ArcSin[c*x])] + Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcS
in[c*x])] + 2*Log[a + b*ArcSin[c*x]] - 4*Log[8*(a + b*ArcSin[c*x])] - Sin[(
2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 2*Sin[(4*a)/b]*SinIntegral[4*(
a/b + ArcSin[c*x])] + Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(b*c
^3)

Maple [A]
time = 0.09, size = 157, normalized size = 0.76

method	result
default	$\frac{\mathrm{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)+\mathrm{cosineIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\mathrm{sinIntegral}\left(6\arcsin(cx)+\frac{6a}{b}\right)\sin\left(\frac{6a}{b}\right)-\mathrm{cosineInte}}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/32/c^3*(Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+Ci(2*arcsin(c*x)+2*a/b)*cos(2*
a/b)-Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)-Ci(6*arcsin(c*x)+6*a/b)*cos(6*a/b)-
2*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)-2*Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b)+2
*ln(a+b*arcsin(c*x)))/b

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^2/(b*arcsin(c*x) + a), x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral(-(c^2*x^4 - x^2)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{a+b\operatorname{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 473 vs. 2(192) = 384.
time = 0.46, size = 473, normalized size = 2.30

$$-\frac{\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{5}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc^{3}}+\frac{3\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{2bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc^{3}}-\frac{9\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{16bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{16bc^{3}}-\frac{3\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{16bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{4bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{16bc^{3}}+\frac{\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{32bc^{3}}-\frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{16bc^{3}}-\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{32bc^{3}}+\frac{\log\left(b\arcsin\left(cx\right)+a\right)}{16bc^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - cos(a/b)^5*sin(a/
b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 3/2*cos(a/b)^4*cos_integra
l(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/2*cos(a/b)^4*cos_integral(4*a/b + 4*ar
csin(c*x))/(b*c^3) + cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x)
)/(b*c^3) - 1/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*
c^3) - 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/2*co
s(a/b)^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)^2*cos_
integral(2*a/b + 2*arcsin(c*x))/(b*c^3) - 3/16*cos(a/b)*sin(a/b)*sin_integr
al(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/4*cos(a/b)*sin(a/b)*sin_integral(4*a/
b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*
arcsin(c*x))/(b*c^3) + 1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1
/16*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) - 1/32*cos_integral(2*a/b +
 2*arcsin(c*x))/(b*c^3) + 1/16*log(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(1-c^2\,x^2\right)}^{3/2}}{a+b\,\mathrm{asin}\left(c\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.327 $\int \frac{x(1-c^2x^2)^{3/2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=183

$$-\frac{\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^2}-\frac{3\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^2}-\frac{\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(}{b}\right.}{16bc^2}$$

```
[Out] 1/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2+3/16*cos(3*a/b)*Si(3*(a+b*arcsin
(c*x))/b)/b/c^2+1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^2-1/8*Ci((a+b
*arcsin(c*x))/b)*sin(a/b)/b/c^2-3/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b
/c^2-1/16*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^2
```

Rubi [A]
time = 0.23, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^2}-\frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^2}-\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^2}+\frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^2}+\frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/8*(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^2) - (3*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^2) - (CosIntegral[(5*(a +
 b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^2) + (Cos[a/b]*SinIntegral[(a + b
*ArcSin[c*x])/b])/(8*b*c^2) + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[
c*x]))/b])/(16*b*c^2) + (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(16*b*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^2}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{\sin(x)}{8(a+bx)}+\frac{3\sin(3x)}{16(a+bx)}+\frac{\sin(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^2}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^2}+\frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^2}+\frac{3\text{Subst}\left(\int \frac{\sin(3}{a+b}\right.}{}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^2}+\frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \sin\right.}{16c^2}$$
$$= -\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^2}-\frac{3\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16bc^2}-\frac{\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(cx)\right)}{16bc^2}$$

Mathematica [A]
time = 0.34, size = 136, normalized size = 0.74

$$\frac{-2\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-3\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)-\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{5a}{b}\right)+2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+3\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\cos\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] - CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + 2*
```

```
Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*SinIntegral[3*(a/b
 + ArcSin[c*x])] + Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*c
^2)
```

Maple [A]
time = 0.09, size = 139, normalized size = 0.76

method	result
default	$\frac{\text{sinIntegral}\left(5 \arcsin\left(cx\right)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)-\text{cosineIntegral}\left(5 \arcsin\left(cx\right)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)+3\,\text{sinIntegral}\left(3 \arcsin\left(cx\right)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-3\,\text{cosine}}{16c^2 b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/16/c^2*(Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*
a/b)+3*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a
/b)+2*Si(arcsin(c*x)+a/b)*cos(a/b)-2*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-(c^2*x^3 - x)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{a+b\,\text{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 360 vs. $2(171) = 342$.
time = 0.46, size = 360, normalized size = 1.97

$$-\frac{\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^{2}}+\frac{\cos\left(\frac{a}{b}\right)^{5}\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{bc^{2}}+\frac{3\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{2}}-\frac{3\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{2}}-\frac{5\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{4bc^{2}}+\frac{3\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{4bc^{2}}-\frac{\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{2}}+\frac{3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{2}}-\frac{\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{8bc^{2}}+\frac{5\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{16bc^{2}}-\frac{9\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{16bc^{2}}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{8bc^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^5*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^2) + 3/4*cos(a/b)^2*cos_integra
l(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) - 3/4*cos(a/b)^2*cos_integral(3*a
/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/4*cos(a/b)^3*sin_integral(5*a/b +
5*arcsin(c*x))/(b*c^2) + 3/4*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))
/(b*c^2) - 1/16*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) + 3/16
*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 1/8*cos_integral(a/
b + arcsin(c*x))*sin(a/b)/(b*c^2) + 5/16*cos(a/b)*sin_integral(5*a/b + 5*ar
csin(c*x))/(b*c^2) - 9/16*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c
^2) + 1/8*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\left(1-c^2\,x^2\right)}^{3/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.328 $\int \frac{\left(1-c^2x^2\right)^{3/2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=144

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc}+\frac{3\log(a+b\text{ArcSin}(cx))}{8bc}+$$

```
[Out] 1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c+1/8*Ci(4*(a+b*arcsin(c*x))/b)*
cos(4*a/b)/b/c+3/8*ln(a+b*arcsin(c*x))/b/c+1/2*Si(2*(a+b*arcsin(c*x))/b)*si
n(2*a/b)/b/c+1/8*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c
```

Rubi [A]
time = 0.15, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4753, 3393, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc}+\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc}+\frac{3\log(a+b\text{ArcSin}(cx))}{8bc}$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c) + (Cos[(4*a)/
b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c) + (3*Log[a + b*ArcSin[c*
x]])/(8*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c
) + (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx &= \frac{\operatorname{Subst}\left(\int \frac{\cos^4(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c} \\
&= \frac{\operatorname{Subst}\left(\int \left(\frac{3}{8(a+bx)}+\frac{\cos(2x)}{2(a+bx)}+\frac{\cos(4x)}{8(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c} \\
&= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc}+\frac{\operatorname{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c}+\frac{\operatorname{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \operatorname{si}\right.}{2c} \\
&= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc}+\frac{\cos\left(\frac{2a}{b}\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c}+\frac{\cos\left(\frac{4a}{b}\right)\operatorname{Sul}}{b} \\
&= \frac{\cos\left(\frac{2a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc}+\frac{\cos\left(\frac{4a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc}+\frac{3\log\left(a+b\sin^{-1}(cx\right.}{8bc}
\end{aligned}$$

Mathematica [A]

time = 0.22, size = 121, normalized size = 0.84

$$\frac{4\cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(2\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)+\cos\left(\frac{4a}{b}\right)\operatorname{CosIntegral}\left(4\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)+4\log(a+b\operatorname{ArcSin}(cx))-\log(8(a+b\operatorname{ArcSin}(cx)))+4\sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(2\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)+\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(4\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)}{8bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Cos[(4*a)/b]*CosIntegr
al[4*(a/b + ArcSin[c*x])] + 4*Log[a + b*ArcSin[c*x]] - Log[8*(a + b*ArcSin[
c*x])] + 4*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + Sin[(4*a)/b]*S
inIntegral[4*(a/b + ArcSin[c*x])])/(8*b*c)
```

Maple [A]

time = 0.10, size = 111, normalized size = 0.77

method	result
default	$\frac{\mathrm{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+\mathrm{cosineIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)+4\,\mathrm{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)+4\,\mathrm{cosineI}}{8cb}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/c*(Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b
)+4*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+4*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)
+3*ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [A]
time = 0.43, size = 252, normalized size = 1.75

$$\frac{\cos\left(\frac{a}{b}\right)^{4}\mathrm{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc}+\frac{\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc}-\frac{\cos\left(\frac{a}{b}\right)^{2}\mathrm{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc}+\frac{\cos\left(\frac{a}{b}\right)^{2}\mathrm{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc}-\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc}+\frac{\mathrm{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{8bc}-\frac{\mathrm{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{2bc}+\frac{3\log\left(b\arcsin\left(cx\right)+a\right)}{8bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c) + cos(a/b)^3*sin(a/b)*
sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) - cos(a/b)^2*cos_integral(4*a/b +
 4*arcsin(c*x))/(b*c) + cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c
) - 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) + cos(a
/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c) + 1/8*cos_integral(4
*a/b + 4*arcsin(c*x))/(b*c) - 1/2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c)
 + 3/8*log(b*arcsin(c*x) + a)/(b*c)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(1 - c^2 x^2)^{3/2}}{a + b \operatorname{asin}(c x)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x)),x)
```

```
[Out] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x)), x)
```

3.329 $\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\textbf{ArcSin}(cx))} dx$

Optimal. Leaf size=140

$$\frac{5\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b}+\frac{\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b}-\frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b}$$

```
[Out] -5/4*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b-1/4*cos(3*a/b)*Si(3*(a+b*arcsin(c*x
))/b)/b+5/4*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b+1/4*Ci(3*(a+b*arcsin(c*x))/b
)*sin(3*a/b)/b+Unintegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.48, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b) + (CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b) - (5*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(4*b) - (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(4*b) + Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\sin^{-1}(cx))}\,dx = \int \left(\frac{1}{x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))} - \frac{2c^2x}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))} + \frac{}{\sqrt{1-c^2x^2}}\right.$$

$$= -\left((2c^2)\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx\right) + c^4\int \frac{x^3}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(ca}$$

$$= -\left(2\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)\right) + \int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx$$

$$= -\left(\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)\right) + \left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\right.$$

$$= \frac{2\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b} - \frac{1}{4}\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\right.$$

$$= \frac{2\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b} + \frac{1}{4}\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}$$

$$= \frac{5\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{4b} + \frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{4b} - \frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{si}\right.}{4b}$$

Mathematica [A]
time = 2.11, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x*arcsin(c*x) + a*x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx - 1\right)\left(cx + 1\right)\right)^{\frac{3}{2}}}{x\left(a + b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))), x)
```

3.330 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=107

$$-\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2b}-\frac{3c\log(a+b\text{ArcSin}(cx))}{2b}-\frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2b}+\text{Int}\Big($$

```
[Out] -1/2*c*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b-3/2*c*ln(a+b*arcsin(c*x))/b-1
/2*c*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b+Unintegrable(1/x^2/(a+b*arcsin(
c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/2*(c*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/b - (3*c*Log[a
 + b*ArcSin[c*x]])/(2*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x
]))/b])/(2*b) + Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x
]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\sin^{-1}(cx))}\,dx = \int \left(-\frac{2c^2}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))} + \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))} + \frac{}{\sqrt{1-c}}\right.$$

$$= -\left((2c^2)\int \frac{1}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx\right) + c^4\int \frac{x^2}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(c}$$

$$= -\frac{2c\log(a+b\sin^{-1}(cx))}{b} + c\text{Subst}\left(\int \frac{\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right) + \int \frac{}{x^2\sqrt{1-c}}$$

$$= -\frac{2c\log(a+b\sin^{-1}(cx))}{b} + c\text{Subst}\left(\int \left(\frac{1}{2(a+bx)} - \frac{\cos(2x)}{2(a+bx)}\right) dx, x, \sin^{-1}(c\right.$$

$$= -\frac{3c\log(a+b\sin^{-1}(cx))}{2b} - \frac{1}{2}c\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right) + \int \frac{}{x^2\sqrt{1-}}$$

$$= -\frac{3c\log(a+b\sin^{-1}(cx))}{2b} - \frac{1}{2}\left(c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-}\right.$$

$$= -\frac{c\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2b} - \frac{3c\log(a+b\sin^{-1}(cx))}{2b} - \frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+\right.}{2b}$$

Mathematica [A]
time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^2(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x^{2}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**2/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**2*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))),x)
```

```
[Out] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))), x)
```

3.331 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 3.77, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 2.50, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^3\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^3), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^3*arcsin(c*x) + a*x^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x^{3}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**3/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**3*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]

time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(1-c^2\,x^2\right)^{3/2}}{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))), x)
```

3.332 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left(\frac{(1-c^2x^2)^{3/2}}{x^4(a+b\operatorname{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\operatorname{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 0.55, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\operatorname{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 2.82, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^4\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^4*arcsin(c*x) + a*x^4), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-(cx-1)(cx+1))^{\frac{3}{2}}}{x^4(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**4/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**4*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{(1 - c^2 x^2)^{3/2}}{x^4 \, (a + b \operatorname{asin}(c x))} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))), x)
```

3.333 $\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=245

$$-\frac{3\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{128bc^4}-\frac{\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{32bc^4}+\frac{3\text{CosIntegral}\left(\frac{7(a+b\text{ArcSin}(}{b}\right.}{256bc^4}$$

```
[Out] 3/128*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4+1/32*cos(3*a/b)*Si(3*(a+b*arcs
in(c*x))/b)/b/c^4-3/256*cos(7*a/b)*Si(7*(a+b*arcsin(c*x))/b)/b/c^4-1/256*co
s(9*a/b)*Si(9*(a+b*arcsin(c*x))/b)/b/c^4-3/128*Ci((a+b*arcsin(c*x))/b)*sin(
a/b)/b/c^4-1/32*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^4+3/256*Ci(7*(a+b*
arcsin(c*x))/b)*sin(7*a/b)/b/c^4+1/256*Ci(9*(a+b*arcsin(c*x))/b)*sin(9*a/b)
/b/c^4
```

Rubi [A]
time = 0.33, antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{128bc^4}-\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^4}+\frac{3\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{256bc^4}+\frac{\sin\left(\frac{9a}{b}\right)\text{CosIntegral}\left(\frac{9(a+b\text{ArcSin}(cx))}{b}\right)}{256bc^4}+\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{128bc^4}+\frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^4}-\frac{3\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{256bc^4}-\frac{\cos\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\text{ArcSin}(cx))}{b}\right)}{256bc^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(128*b*c^4) - (CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(32*b*c^4) + (3*CosIntegral[(7*(a
 + b*ArcSin[c*x]))/b]*Sin[(7*a)/b])/(256*b*c^4) + (CosIntegral[(9*(a + b*Ar
cSin[c*x]))/b]*Sin[(9*a)/b])/(256*b*c^4) + (3*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(128*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*
x]))/b])/(32*b*c^4) - (3*Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b
])/(256*b*c^4) - (Cos[(9*a)/b]*SinIntegral[(9*(a + b*ArcSin[c*x]))/b])/(256
*b*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^6(x)\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^4}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{128(a+bx)}+\frac{\sin(3x)}{32(a+bx)}-\frac{3\sin(7x)}{256(a+bx)}-\frac{\sin(9x)}{256(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^4}$$
$$= -\frac{\text{Subst}\left(\int \frac{\sin(9x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{256c^4} - \frac{3\text{Subst}\left(\int \frac{\sin(7x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{256c^4} + \frac{3\text{Subst}\left(\right.}{}$$
$$= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{128c^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx, x, \right.}{32c^4}$$
$$= -\frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{128bc^4} - \frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{32bc^4} + \frac{3\text{Ci}\left(\frac{7a}{b}+7\sin^{-1}(c\right.}{256bc^4}$$

Mathematica [A]
time = 0.81, size = 180, normalized size = 0.73

$$\frac{-6\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-8\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)+3\text{CosIntegral}\left(7\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{7a}{b}\right)+\text{CosIntegral}\left(9\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{9a}{b}\right)+6\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+8\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-3\cos\left(\frac{7a}{b}\right)\text{Si}\left(7\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\cos\left(\frac{9a}{b}\right)\text{Si}\left(9\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{256bc^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-6*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 8*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] + 3*CosIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] +
CosIntegral[9*(a/b + ArcSin[c*x])]*Sin[(9*a)/b] + 6*Cos[a/b]*SinIntegral[a/
b + ArcSin[c*x]] + 8*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 3*Co
s[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] - Cos[(9*a)/b]*SinIntegral[9*
(a/b + ArcSin[c*x])])/(256*b*c^4)
```

Maple [A]
time = 0.10, size = 185, normalized size = 0.76

method	result
default	$\frac{6\,\mathrm{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-6\,\mathrm{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+8\,\mathrm{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-\mathrm{sinIntegral}(9\,}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/256/c^4*(6*Si(arcsin(c*x)+a/b)*cos(a/b)-6*Ci(arcsin(c*x)+a/b)*sin(a/b)+8*
Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-Si(9*arcsin(c*x)+9*a/b)*cos(9*a/b)+Ci(9*
arcsin(c*x)+9*a/b)*sin(9*a/b)-8*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)-3*Si(7*a
rcsin(c*x)+7*a/b)*cos(7*a/b)+3*Ci(7*arcsin(c*x)+7*a/b)*sin(7*a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^3/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^7 - 2*c^2*x^5 + x^3)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 746 vs. 2(229) = 458.
time = 0.45, size = 746, normalized size = 3.04

$$\frac{\cos\left(\frac{a}{b}\right)^{8}\operatorname{Ci}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^{4}}-\frac{\cos\left(\frac{a}{b}\right)^{9}\operatorname{Si}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)}{bc^{4}}-\frac{7\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{4}}+\frac{3\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{4}}+\frac{9\cos\left(\frac{a}{b}\right)^{7}\operatorname{Si}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)}{4bc^{4}}-\frac{3\cos\left(\frac{a}{b}\right)^{7}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{4bc^{4}}+\frac{15\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{4}}-\frac{15\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{4}}-\frac{27\cos\left(\frac{a}{b}\right)^{5}\operatorname{Si}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)}{16bc^{4}}+\frac{21\cos\left(\frac{a}{b}\right)^{5}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{16bc^{4}}-\frac{5\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{32bc^{4}}+\frac{9\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{32bc^{4}}-\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{8bc^{4}}+\frac{15\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)}{32bc^{4}}-\frac{21\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{32bc^{4}}+\frac{\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{8bc^{4}}+\frac{\operatorname{Ci}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{256bc^{4}}-\frac{3\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{256bc^{4}}+\frac{\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{32bc^{4}}-\frac{3\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{128bc^{4}}-\frac{9\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{9a}{b}+9\arcsin\left(cx\right)\right)}{256bc^{4}}+\frac{21\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{256bc^{4}}-\frac{3\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{32bc^{4}}+\frac{3\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{128bc^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^8*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^
9*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) - 7/4*cos(a/b)^6*cos_integral
(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) + 3/4*cos(a/b)^6*cos_integral(7*a/
b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 9/4*cos(a/b)^7*sin_integral(9*a/b + 9
*arcsin(c*x))/(b*c^4) - 3/4*cos(a/b)^7*sin_integral(7*a/b + 7*arcsin(c*x))/
(b*c^4) + 15/16*cos(a/b)^4*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*
c^4) - 15/16*cos(a/b)^4*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4
) - 27/16*cos(a/b)^5*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) + 21/16*co
s(a/b)^5*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 5/32*cos(a/b)^2*cos_
integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) + 9/32*cos(a/b)^2*cos_inte
gral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/8*cos(a/b)^2*cos_integral(
3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) + 15/32*cos(a/b)^3*sin_integral(9*a
/b + 9*arcsin(c*x))/(b*c^4) - 21/32*cos(a/b)^3*sin_integral(7*a/b + 7*arcsi
n(c*x))/(b*c^4) + 1/8*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4
) + 1/256*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/256*cos_
integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 1/32*cos_integral(3*a/b
+ 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/128*cos_integral(a/b + arcsin(c*x))*s
in(a/b)/(b*c^4) - 9/256*cos(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4
) + 21/256*cos(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 3/32*cos(
a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 3/128*cos(a/b)*sin_integ
ral(a/b + arcsin(c*x))/(b*c^4)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(1-c^2\,x^2\right)}^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.334 $\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=268

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\right.}{}\right.}{32bc^3}$$

```
[Out] 1/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^3-1/32*Ci(4*(a+b*arcsin(c*x))
/b)*cos(4*a/b)/b/c^3-1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c^3-1/128*
Ci(8*(a+b*arcsin(c*x))/b)*cos(8*a/b)/b/c^3+5/128*ln(a+b*arcsin(c*x))/b/c^3+
1/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^3-1/32*Si(4*(a+b*arcsin(c*x))
/b)*sin(4*a/b)/b/c^3-1/32*Si(6*(a+b*arcsin(c*x))/b)*sin(6*a/b)/b/c^3-1/128*
Si(8*(a+b*arcsin(c*x))/b)*sin(8*a/b)/b/c^3
```

Rubi [A]
time = 0.32, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\cos\left(\frac{8a}{b}\right)\text{CosIntegral}\left(\frac{8(a+b\text{ArcSin}(cx))}{b}\right)}{128bc^3}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc^3}-\frac{\sin\left(\frac{8a}{b}\right)\text{Si}\left(\frac{8(a+b\text{ArcSin}(cx))}{b}\right)}{128bc^3}+\frac{5\log(a+b\text{ArcSin}(cx))}{128bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(4*
a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(6*a)/b]*Co
sIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(8*a)/b]*CosIntegra
l[(8*(a + b*ArcSin[c*x]))/b])/(128*b*c^3) + (5*Log[a + b*ArcSin[c*x]])/(128
*b*c^3) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3)
- (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Sin[(
6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Sin[(8*a)/b]*
SinIntegral[(8*(a + b*ArcSin[c*x]))/b])/(128*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2\left(1-c^2x^2\right)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^6(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{5}{128(a+bx)}+\frac{\cos(2x)}{32(a+bx)}-\frac{\cos(4x)}{32(a+bx)}-\frac{\cos(6x)}{32(a+bx)}-\frac{\cos(8x)}{128(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^3}$$

$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{128bc^3} - \frac{\text{Subst}\left(\int \frac{\cos(8x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{128c^3} + \frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x,\right.}{32c^3}$$

$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{128bc^3} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{S}}{}$$

$$= \frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}+6\right.}{32bc^3}$$

<u>Mathematica</u> [A]
time = 0.71, size = 209, normalized size = 0.78

$$-\frac{-4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+4\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+4\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\cos\left(\frac{8a}{b}\right)\text{CosIntegral}\left(8\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+11\log(a+b\text{ArcSin}(cx))-16\log(8(a+b\text{ArcSin}(cx)))-4\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+4\sin\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+4\sin\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\sin\left(\frac{8a}{b}\right)\text{Si}\left(8\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{128bc^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/128*(-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 4*Cos[(4*a)/b]
*CosIntegral[4*(a/b + ArcSin[c*x])] + 4*Cos[(6*a)/b]*CosIntegral[6*(a/b + A
rcSin[c*x])] + Cos[(8*a)/b]*CosIntegral[8*(a/b + ArcSin[c*x])] + 11*Log[a +
 b*ArcSin[c*x]] - 16*Log[8*(a + b*ArcSin[c*x])] - 4*Sin[(2*a)/b]*SinIntegra
l[2*(a/b + ArcSin[c*x])] + 4*Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])
] + 4*Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + Sin[(8*a)/b]*SinInt
egral[8*(a/b + ArcSin[c*x])])/(b*c^3)
```

Maple [A]
time = 0.09, size = 203, normalized size = 0.76

method	result
default	$-\frac{4\,\mathrm{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+4\,\mathrm{cosineIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-4\,\mathrm{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)+\mathrm{sinIn}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/128/c^3*(4*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+4*Ci(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)-4*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+Si(8*arcsin(c*x)+8*a/b)*sin
(8*a/b)+Ci(8*arcsin(c*x)+8*a/b)*cos(8*a/b)-4*Ci(2*arcsin(c*x)+2*a/b)*cos(2*
a/b)+4*Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+4*Ci(6*arcsin(c*x)+6*a/b)*cos(6*a
/b)-5*ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^2/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^6 - 2*c^2*x^4 + x^2)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a)
, x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\left(-\left(cx - 1\right)\left(cx + 1\right)\right)^{\frac{5}{2}}}{a + b\,\mathrm{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 757 vs. 2(250) = 500.
time = 0.45, size = 757, normalized size = 2.82

$$-\frac{\cos\left(\frac{a}{b}\right)^{8}\operatorname{Ci}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{7}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{bc^{3}}+\frac{2\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc^{3}}+\frac{3\cos\left(\frac{a}{b}\right)^{5}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{2bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{5}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc^{3}}-\frac{5\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{4bc^{3}}+\frac{3\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{2bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{4bc^{3}}-\frac{5\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{8bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc^{3}}-\frac{\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{4bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{4bc^{3}}-\frac{9\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{16bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{4bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{16bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{16bc^{3}}-\frac{3\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{16bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{8bc^{3}}+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{16bc^{3}}-\frac{\operatorname{Ci}\left(\frac{8a}{b}+8\arcsin\left(cx\right)\right)}{128bc^{3}}+\frac{\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{32bc^{3}}-\frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{32bc^{3}}-\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{32bc^{3}}+\frac{5\log\left(b\arcsin\left(cx\right)+a\right)}{128bc^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^8*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) - cos(a/b)^7*sin(a/
b)*sin_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 2*cos(a/b)^6*cos_integral(
8*a/b + 8*arcsin(c*x))/(b*c^3) - cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c
*x))/(b*c^3) + 3/2*cos(a/b)^5*sin(a/b)*sin_integral(8*a/b + 8*arcsin(c*x))/
(b*c^3) - cos(a/b)^5*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) -
 5/4*cos(a/b)^4*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 3/2*cos(a/b)^
4*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/4*cos(a/b)^4*cos_integral
(4*a/b + 4*arcsin(c*x))/(b*c^3) - 5/8*cos(a/b)^3*sin(a/b)*sin_integral(8*a/
b + 8*arcsin(c*x))/(b*c^3) + cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arc
sin(c*x))/(b*c^3) - 1/4*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c
*x))/(b*c^3) + 1/4*cos(a/b)^2*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) -
 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/4*cos(a/b)
^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)^2*cos_integr
al(2*a/b + 2*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(8*a
/b + 8*arcsin(c*x))/(b*c^3) - 3/16*cos(a/b)*sin(a/b)*sin_integral(6*a/b + 6
*arcsin(c*x))/(b*c^3) + 1/8*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin
(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))
/(b*c^3) - 1/128*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 1/32*cos_int
egral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/32*cos_integral(4*a/b + 4*arcsin(c
*x))/(b*c^3) - 1/32*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) + 5/128*log
(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(1-c^2\,x^2\right)}^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
[Out] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.335 $\int \frac{x\left(1-c^2x^2\right)^{5/2}}{a+b\textbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=245

$$-\frac{5\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{64bc^2}-\frac{9\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{64bc^2}-\frac{5\text{CosIntegral}\left(\frac{5(a+b\text{ArcS}}{b}\right.}{64bc^2}$$

```
[Out] 5/64*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2+9/64*cos(3*a/b)*Si(3*(a+b*arcsi
n(c*x))/b)/b/c^2+5/64*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^2+1/64*cos(7
*a/b)*Si(7*(a+b*arcsin(c*x))/b)/b/c^2-5/64*Ci((a+b*arcsin(c*x))/b)*sin(a/b)
/b/c^2-9/64*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^2-5/64*Ci(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b/c^2-1/64*Ci(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b/c^2
```

Rubi [A]
time = 0.29, antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$-\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64bc^2}-\frac{9\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^2}-\frac{5\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^2}-\frac{\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^2}+\frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64bc^2}+\frac{9\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^2}+\frac{5\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^2}+\frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64bc^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(64*b*c^2) - (9*CosIntegra
l[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(64*b*c^2) - (5*CosIntegral[(5*(
a + b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(64*b*c^2) - (CosIntegral[(7*(a + b*Ar
cSin[c*x]))/b]*Sin[(7*a)/b])/(64*b*c^2) + (5*Cos[a/b]*SinIntegral[(a + b*Ar
cSin[c*x])/b])/(64*b*c^2) + (9*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*
x]))/b])/(64*b*c^2) + (5*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(64*b*c^2) + (Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b
*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos^6(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{c^2}\\
&= \frac{\text{Subst}\left(\int \left(\frac{5\sin(x)}{64(a+bx)}+\frac{9\sin(3x)}{64(a+bx)}+\frac{5\sin(5x)}{64(a+bx)}+\frac{\sin(7x)}{64(a+bx)}\right)dx,x,\sin^{-1}(cx)\right)}{c^2}\\
&= \frac{\text{Subst}\left(\int \frac{\sin(7x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{64c^2}+\frac{5\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{64c^2}+\frac{5\text{Subst}\left(\int \frac{\sin}{a-}\right.}{}\\
&= \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{64c^2}+\frac{\left(9\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}+3x\right)}{a+bx}\,dx,x\right.}{64c^2}\\
&= -\frac{5\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^2}-\frac{9\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{64bc^2}-\frac{5\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(c\right.}{64bc^2}
\end{aligned}$$

Mathematica [A]
time = 0.65, size = 180, normalized size = 0.73

$$\frac{-5\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-9\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)-5\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{5a}{b}\right)-\text{CosIntegral}\left(7\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{7a}{b}\right)+5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+9\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+5\cos\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\cos\left(\frac{7a}{b}\right)\text{Si}\left(7\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{64bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 9*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] - 5*CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] -
CosIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] + 5*Cos[a/b]*SinIntegral[a/
b + ArcSin[c*x]] + 9*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*Co
s[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + Cos[(7*a)/b]*SinIntegral[7*
(a/b + ArcSin[c*x])])/(64*b*c^2)
```

Maple [A]
time = 0.10, size = 185, normalized size = 0.76

method	result
default	$\frac{\mathrm{sinIntegral}\left(7\arcsin(cx)+\frac{7a}{b}\right)\cos\left(\frac{7a}{b}\right)-\mathrm{cosineIntegral}\left(7\arcsin(cx)+\frac{7a}{b}\right)\sin\left(\frac{7a}{b}\right)+5\,\mathrm{sinIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)-5\,\mathrm{cosine}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/64/c^2*(Si(7*arcsin(c*x)+7*a/b)*cos(7*a/b)-Ci(7*arcsin(c*x)+7*a/b)*sin(7*
a/b)+5*Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-5*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a
/b)+9*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-9*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/
b)+5*Si(arcsin(c*x)+a/b)*cos(a/b)-5*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^5 - 2*c^2*x^3 + x)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a),
x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(-(cx-1)(cx+1))^{\frac{5}{2}}}{a+b\operatorname{asin}(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 614 vs. 2(229) = 458.
time = 0.46, size = 614, normalized size = 2.51

$$-\frac{\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^{2}}+\frac{\cos\left(\frac{a}{b}\right)^{7}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{bc^{2}}+\frac{5\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{2}}-\frac{5\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4bc^{2}}-\frac{7\cos\left(\frac{a}{b}\right)^{5}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{4bc^{2}}+\frac{5\cos\left(\frac{a}{b}\right)^{5}\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{4bc^{2}}-\frac{3\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{8bc^{2}}+\frac{15\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{2}}-\frac{9\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{16bc^{2}}+\frac{7\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{8bc^{2}}-\frac{25\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{16bc^{2}}+\frac{9\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{16bc^{2}}+\frac{\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{2}}-\frac{5\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{2}}+\frac{9\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{2}}-\frac{5\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{64bc^{2}}-\frac{7\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{7a}{b}+7\arcsin\left(cx\right)\right)}{64bc^{2}}+\frac{25\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin\left(cx\right)\right)}{64bc^{2}}-\frac{27\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{64bc^{2}}+\frac{5\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{64bc^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^6*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^7*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^2) + 5/4*cos(a/b)^4*cos_integra
l(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/4*cos(a/b)^4*cos_integral(5*a
/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) - 7/4*cos(a/b)^5*sin_integral(7*a/b +
7*arcsin(c*x))/(b*c^2) + 5/4*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))
/(b*c^2) - 3/8*cos(a/b)^2*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c
^2) + 15/16*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2)
 - 9/16*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) + 7
/8*cos(a/b)^3*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^2) - 25/16*cos(a/b)^
3*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^2) + 9/16*cos(a/b)^3*sin_integra
l(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/64*cos_integral(7*a/b + 7*arcsin(c*x))
*sin(a/b)/(b*c^2) - 5/64*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^
2) + 9/64*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/64*cos_i
ntegral(a/b + arcsin(c*x))*sin(a/b)/(b*c^2) - 7/64*cos(a/b)*sin_integral(7*
a/b + 7*arcsin(c*x))/(b*c^2) + 25/64*cos(a/b)*sin_integral(5*a/b + 5*arcsin
(c*x))/(b*c^2) - 27/64*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2)
 + 5/64*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,{\left(1-c^2\,x^2\right)}^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.336 $\int \frac{(1-c^2x^2)^{5/2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=206

$$\frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc}+\frac{3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}}{32b}$$

```
[Out] 15/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c+3/16*Ci(4*(a+b*arcsin(c*x))/
b)*cos(4*a/b)/b/c+1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c+5/16*ln(a+b
*arcsin(c*x))/b/c+15/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c+3/16*Si(4*
(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c+1/32*Si(6*(a+b*arcsin(c*x))/b)*sin(6*a/
b)/b/c
```

Rubi [A]
time = 0.21, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4753, 3393, 3384, 3380, 3383}

$$\frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc}+\frac{3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc}+\frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc}+\frac{15\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{32bc}+\frac{3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{16bc}+\frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{32bc}+\frac{5\log(a+b\text{ArcSin}(cx))}{16bc}$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c) + (3*Cos[
(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c) + (Cos[(6*a)/b]*C
osIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c) + (5*Log[a + b*ArcSin[c*x]]
)/(16*b*c) + (15*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b
*c) + (3*Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c) + (S
in[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^6(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{5}{16(a+bx)} + \frac{15\cos(2x)}{32(a+bx)} + \frac{3\cos(4x)}{16(a+bx)} + \frac{\cos(6x)}{32(a+bx)}\right) dx, x, \sin^{-1}(cx)\right)}{c}$$

$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{16bc} + \frac{\text{Subst}\left(\int \frac{\cos(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c} + \frac{3\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \text{s}\right.}{16c}$$

$$= \frac{5\log\left(a+b\sin^{-1}(cx)\right)}{16bc} + \frac{\left(15\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{32c} + \frac{(3\cos}{}$$

$$= \frac{15\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{32bc} + \frac{3\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{16bc} + \frac{\cos\left(\frac{6a}{b}\right)\text{Ci}\left(\frac{6a}{b}\right.}{32}$$

Mathematica [A]
time = 0.47, size = 165, normalized size = 0.80

$$\frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + 6\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + \cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + 18\log(a+b\text{ArcSin}(cx)) - 8\log(8(a+b\text{ArcSin}(cx))) + 15\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + 6\sin\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + \sin\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{32bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 6*Cos[(4*a)/b]*CosInt
egral[4*(a/b + ArcSin[c*x])] + Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[c*x
```

```
])] + 18*Log[a + b*ArcSin[c*x]] - 8*Log[8*(a + b*ArcSin[c*x])] + 15*Sin[(2*
a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 6*Sin[(4*a)/b]*SinIntegral[4*(a/
b + ArcSin[c*x])] + Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(32*b*
c)
```

Maple [A]
time = 0.09, size = 157, normalized size = 0.76

method	result
default	$\frac{\mathrm{sinIntegral}\left(6\arcsin(cx)+\frac{6a}{b}\right)\sin\left(\frac{6a}{b}\right)+\mathrm{cosineIntegral}\left(6\arcsin(cx)+\frac{6a}{b}\right)\cos\left(\frac{6a}{b}\right)+6\,\mathrm{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+6\,\mathrm{cosineI}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/c*(Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+Ci(6*arcsin(c*x)+6*a/b)*cos(6*a/
b)+6*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+6*Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b
)+15*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+15*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/
b)+10*ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a),
x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-(cx-1)(cx+1))^{\frac{5}{2}}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 472 vs. 2(192) = 384.
time = 0.45, size = 472, normalized size = 2.29

$$\frac{\cos\left(\frac{a}{b}\right)^{6}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc}+\frac{\cos\left(\frac{a}{b}\right)^{5}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc}-\frac{3\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{2bc}+\frac{3\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc}-\frac{\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{bc}+\frac{3\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc}+\frac{9\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{16bc}-\frac{3\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc}+\frac{15\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{16bc}+\frac{3\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{16bc}-\frac{3\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{4bc}+\frac{15\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{16bc}-\frac{\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin\left(cx\right)\right)}{32bc}+\frac{3\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{16bc}-\frac{15\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{32bc}+\frac{5\log\left(b\arcsin\left(cx\right)+a\right)}{16bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) + cos(a/b)^5*sin(a/b)*
sin_integral(6*a/b + 6*arcsin(c*x))/(b*c) - 3/2*cos(a/b)^4*cos_integral(6*a
/b + 6*arcsin(c*x))/(b*c) + 3/2*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*
x))/(b*c) - cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c) +
 3/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) + 9/16*c
os(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) - 3/2*cos(a/b)^2*cos_in
tegral(4*a/b + 4*arcsin(c*x))/(b*c) + 15/16*cos(a/b)^2*cos_integral(2*a/b +
 2*arcsin(c*x))/(b*c) + 3/16*cos(a/b)*sin(a/b)*sin_integral(6*a/b + 6*arcsi
n(c*x))/(b*c) - 3/4*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(
b*c) + 15/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c) -
1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) + 3/16*cos_integral(4*a/b +
4*arcsin(c*x))/(b*c) - 15/32*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c) + 5/
16*log(b*arcsin(c*x) + a)/(b*c)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x)),x)
```

```
[Out] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x)), x)
```

3.337 $\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=196

$$\frac{11\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b}+\frac{7\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b}+\frac{\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}}{b}\right.}{16b}$$

```
[Out] -11/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b-7/16*cos(3*a/b)*Si(3*(a+b*arcsin(c
*x))/b)/b-1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b+11/8*Ci((a+b*arcsin(c
*x))/b)*sin(a/b)/b+7/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b+1/16*Ci(5*(a
+b*arcsin(c*x))/b)*sin(5*a/b)/b+Unintegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^
2+1)^(1/2),x)
```

Rubi [A]
time = 0.79, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (11*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b) + (7*CosIntegral[(3*
(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b) + (CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b]*Sin[(5*a)/b])/(16*b) - (11*Cos[a/b]*SinIntegral[(a + b*ArcSin[c
*x])/b])/(8*b) - (7*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(1
6*b) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b) + Defer
[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \left(\frac{1}{x\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)} - \frac{3c^2x}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)} + \frac{}{\sqrt{1-c^2x^2}}\right.$$

$$= -\left((3c^2)\int \frac{x}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}\,dx\right) + (3c^4)\int \frac{x^3}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}\right.}$$

$$= -\left(3\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)\right) + 3\text{Subst}\left(\int \frac{\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)$$

$$= 3\text{Subst}\left(\int \left(\frac{3\sin(x)}{4(a+bx)} - \frac{\sin(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right) - \left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\right.$$

$$= \frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b} - \frac{1}{16}\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\right.$$

$$= \frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b} - \frac{1}{8}\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}$$

$$= \frac{11\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8b} + \frac{7\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16b} + \frac{\text{Ci}\left(\frac{5a}{b}+5\sin^{-1}(\right.}{16b}$$

Mathematica [A]
time = 2.10, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.66, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x\left(a+b\arcsin(cx)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x*arcsin(c*x) + a*
x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}{x\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))), x)
```

3.338 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\textbf{ArcSin}(cx))} dx$

Optimal. Leaf size=161

$$-\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b}-\frac{c\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8b}-\frac{15c\log(a+b\text{ArcSin}}{8b}$$

```
[Out] -c*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b-1/8*c*Ci(4*(a+b*arcsin(c*x))/b)*c
os(4*a/b)/b-15/8*c*ln(a+b*arcsin(c*x))/b-c*Si(2*(a+b*arcsin(c*x))/b)*sin(2*
a/b)/b-1/8*c*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b+Unintegrable(1/x^2/(a+b
*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.62, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((c*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/b) - (c*Cos[(4*a)
/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b) - (15*c*Log[a + b*ArcSin[
c*x]])/(8*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/b -
(c*Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b) + Defer[Int][
1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\sin^{-1}(cx))}\,dx = \int \left(-\frac{3c^2}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))} + \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))} + \frac{}{\sqrt{1-c}}\right.$$

$$= -\left((3c^2)\int \frac{1}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx\right) + (3c^4)\int \frac{x^2}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}$$

$$= -\frac{3c\log(a+b\sin^{-1}(cx))}{b} - c\text{Subst}\left(\int \frac{\sin^4(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right) + (3c)\text{Subst}\Big(\int$$

$$= -\frac{3c\log(a+b\sin^{-1}(cx))}{b} - c\text{Subst}\left(\int \left(\frac{3}{8(a+bx)} - \frac{\cos(2x)}{2(a+bx)} + \frac{\cos(4x)}{8(a+bx)}\right)\right.$$

$$= -\frac{15c\log(a+b\sin^{-1}(cx))}{8b} - \frac{1}{8}c\text{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right) + \frac{1}{2}c\text{Subst}\Big($$

$$= -\frac{15c\log(a+b\sin^{-1}(cx))}{8b} + \frac{1}{2}\left(c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin\right.$$

$$= -\frac{c\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{b} - \frac{c\cos\left(\frac{4a}{b}\right)\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8b} - \frac{15c\log(a}{}$$

Mathematica [A]
time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^2(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^2*arcsin(c*x) +
a*x^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}{x^{2}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**2/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**2*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))),x)
```

```
[Out] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))), x)
```

3.339 $\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\mathbf{ArcSin}(cx))} dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^3(a+b\text{ArcSin}(cx))}, x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3\,(a+b\sin^{-1}(cx))} dx = \int \frac{(1-c^2x^2)^{5/2}}{x^3\,(a+b\sin^{-1}(cx))} dx$$

Mathematica [A]
time = 3.70, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 2.54, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^3\,(a+b\arcsin\,(cx))} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^3), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^3*arcsin(c*x) + a*x^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}{x^{3}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**3/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**3*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(1-c^2\,x^2\right)^{5/2}}{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))), x)
```

3.340 $\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 0.62, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 3.06, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^4\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^4*arcsin(c*x) +
a*x^4), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}{x^{4}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**4/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**4*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Mupad [A]

time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(1-c^2\,x^2\right)^{5/2}}{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))), x)
```

3.341 $\int \frac{x^4}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=41

$$-\frac{\text{CosIntegral}(2\text{ArcSin}(ax))}{2a^5}+\frac{\text{CosIntegral}(4\text{ArcSin}(ax))}{8a^5}+\frac{3\log(\text{ArcSin}(ax))}{8a^5}$$

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^5+1/8*Ci(4*arcsin(a*x))/a^5+3/8*ln(arcsin(a*x))/a^
5
```

Rubi [A]
time = 0.11, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {4809, 3393, 3383}

$$-\frac{\text{CosIntegral}(2\text{ArcSin}(ax))}{2a^5}+\frac{\text{CosIntegral}(4\text{ArcSin}(ax))}{8a^5}+\frac{3\log(\text{ArcSin}(ax))}{8a^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -1/2*CosIntegral[2*ArcSin[a*x]]/a^5 + CosIntegral[4*ArcSin[a*x]]/(8*a^5) +
(3*Log[ArcSin[a*x]])/(8*a^5)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^4(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a^5}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{3}{8x} - \frac{\cos(2x)}{2x} + \frac{\cos(4x)}{8x}\right)\,dx, x, \sin^{-1}(ax)\right)}{a^5}$$
$$= \frac{3\log\left(\sin^{-1}(ax)\right)}{8a^5} + \frac{\text{Subst}\left(\int \frac{\cos(4x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{8a^5} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x\right.}{2a^5}$$
$$= -\frac{\text{Ci}(2\sin^{-1}(ax))}{2a^5} + \frac{\text{Ci}(4\sin^{-1}(ax))}{8a^5} + \frac{3\log\left(\sin^{-1}(ax)\right)}{8a^5}$$

Mathematica [A]
time = 0.05, size = 31, normalized size = 0.76

$$\frac{-4\text{CosIntegral}(2\text{ArcSin}(ax)) + \text{CosIntegral}(4\text{ArcSin}(ax)) + 3\log(\text{ArcSin}(ax))}{8a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] (-4*CosIntegral[2*ArcSin[a*x]] + CosIntegral[4*ArcSin[a*x]] + 3*Log[ArcSin[
a*x]])/(8*a^5)
```

Maple [A]
time = 0.17, size = 30, normalized size = 0.73

method	result	size
default	$\frac{3\ln(\arcsin(ax))-4\,\text{cosineIntegral}(2\arcsin(ax))+\text{cosineIntegral}(4\arcsin(ax))}{8a^5}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*(3*ln(arcsin(a*x))-4*Ci(2*arcsin(a*x))+Ci(4*arcsin(a*x)))/a^5
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^4/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}\,\operatorname{asin}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**4/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A]
time = 0.42, size = 35, normalized size = 0.85

$$\frac{\operatorname{Ci}\left(4\arcsin\left(ax\right)\right)}{8\,a^5} - \frac{\operatorname{Ci}\left(2\arcsin\left(ax\right)\right)}{2\,a^5} + \frac{3\log\left(\arcsin\left(ax\right)\right)}{8\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/8*cos_integral(4*arcsin(a*x))/a^5 - 1/2*cos_integral(2*arcsin(a*x))/a^5 +
 3/8*log(arcsin(a*x))/a^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^4}{\operatorname{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^4/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.342 $\int \frac{x^3}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=27

$$\frac{3\text{Si}(\text{ArcSin}(ax))}{4a^4}-\frac{\text{Si}(3\text{ArcSin}(ax))}{4a^4}$$

[Out] 3/4*Si(arcsin(a*x))/a^4-1/4*Si(3*arcsin(a*x))/a^4

Rubi [A]
time = 0.10, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {4809, 3393, 3380}

$$\frac{3\text{Si}(\text{ArcSin}(ax))}{4a^4}-\frac{\text{Si}(3\text{ArcSin}(ax))}{4a^4}$$

Antiderivative was successfully verified.

[In] Int[x^3/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]

[Out] (3*SinIntegral[ArcSin[a*x]])/(4*a^4) - SinIntegral[3*ArcSin[a*x]]/(4*a^4)

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^3(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a^4}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{4x} - \frac{\sin(3x)}{4x}\right)\,dx, x, \sin^{-1}(ax)\right)}{a^4}$$
$$= -\frac{\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{4a^4} + \frac{3\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{4a^4}$$
$$= \frac{3\text{Si}(\sin^{-1}(ax))}{4a^4} - \frac{\text{Si}(3\sin^{-1}(ax))}{4a^4}$$

Mathematica [A]
time = 0.04, size = 24, normalized size = 0.89

$$\frac{3\text{Si}(\text{ArcSin}(ax)) - \text{Si}(3\text{ArcSin}(ax))}{4a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] (3*SinIntegral[ArcSin[a*x]] - SinIntegral[3*ArcSin[a*x]])/(4*a^4)
```

Maple [A]
time = 0.14, size = 21, normalized size = 0.78

method	result	size
default	$-\frac{\text{sinIntegral}(3\arcsin(ax)) - 3\,\text{sinIntegral}(\arcsin(ax))}{4a^4}$	21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/4*(Si(3*arcsin(a*x))-3*Si(arcsin(a*x)))/a^4
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^3/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^3/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\sqrt{-(ax-1)(ax+1)}\,\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^3}{\operatorname{asin}(a\,x)\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] int(x^3/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.343 $\int \frac{x^2}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=27

$$-\frac{\text{CosIntegral}(2\text{ArcSin}(ax))}{2a^3}+\frac{\log(\text{ArcSin}(ax))}{2a^3}$$

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^3+1/2*ln(arcsin(a*x))/a^3
```

Rubi [A]
time = 0.10, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}=0.125$, Rules used = {4809, 3393, 3383}

$$\frac{\log(\text{ArcSin}(ax))}{2a^3}-\frac{\text{CosIntegral}(2\text{ArcSin}(ax))}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -1/2*CosIntegral[2*ArcSin[a*x]]/a^3 + Log[ArcSin[a*x]]/(2*a^3)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2}{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a^3} \\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right)\,dx, x, \sin^{-1}(ax)\right)}{a^3} \\
&= \frac{\log\left(\sin^{-1}(ax)\right)}{2a^3} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{2a^3} \\
&= -\frac{\text{Ci}(2\sin^{-1}(ax))}{2a^3} + \frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}
\end{aligned}
$$

Mathematica [A]
time = 0.04, size = 22, normalized size = 0.81

$$\frac{-\text{CosIntegral}(2\text{ArcSin}(ax)) + \log(\text{ArcSin}(ax))}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] (-CosIntegral[2*ArcSin[a*x]] + Log[ArcSin[a*x]])/(2*a^3)
```

Maple [A]
time = 0.11, size = 21, normalized size = 0.78

method	result	size
default	$\frac{\ln(\arcsin(ax)) - \text{cosineIntegral}(2\arcsin(ax))}{2a^3}$	21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(ln(arcsin(a*x))-Ci(2*arcsin(a*x)))/a^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{-(ax-1)(ax+1)}\,\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**2/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A]
time = 0.42, size = 23, normalized size = 0.85

$$-\frac{\operatorname{Ci}(2\arcsin(ax))}{2a^3}+\frac{\log(\arcsin(ax))}{2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -1/2*cos_integral(2*arcsin(a*x))/a^3 + 1/2*log(arcsin(a*x))/a^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^2}{\operatorname{asin}(a\,x)\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.344 $\int \frac{x^2}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=27

$$-\frac{\text{CosIntegral}(2\text{ArcSin}(ax))}{2a^3}+\frac{\log(\text{ArcSin}(ax))}{2a^3}$$

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^3+1/2*ln(arcsin(a*x))/a^3
```

Rubi [A]
time = 0.10, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4809, 3393, 3383}

$$\frac{\log(\text{ArcSin}(ax))}{2a^3}-\frac{\text{CosIntegral}(2\text{ArcSin}(ax))}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -1/2*CosIntegral[2*ArcSin[a*x]]/a^3 + Log[ArcSin[a*x]]/(2*a^3)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\sin^{-1}(ax)}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{2x} - \frac{\cos(2x)}{2x}\right)\,dx, x, \sin^{-1}(ax)\right)}{a^3}$$
$$= \frac{\log\left(\sin^{-1}(ax)\right)}{2a^3} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{2a^3}$$
$$= -\frac{\text{Ci}(2\sin^{-1}(ax))}{2a^3} + \frac{\log\left(\sin^{-1}(ax)\right)}{2a^3}$$

Mathematica [A]
time = 0.01, size = 22, normalized size = 0.81

$$\frac{-\text{CosIntegral}(2\text{ArcSin}(ax)) + \log(\text{ArcSin}(ax))}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] (-CosIntegral[2*ArcSin[a*x]] + Log[ArcSin[a*x]])/(2*a^3)
```

Maple [A]
time = 0.00, size = 21, normalized size = 0.78

method	result	size
default	$\frac{\ln(\arcsin(ax))-\text{cosineIntegral}(2\arcsin(ax))}{2a^3}$	21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*(ln(arcsin(a*x))-Ci(2*arcsin(a*x)))/a^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^2/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}\,\operatorname{asin}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**2/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A]
time = 0.43, size = 23, normalized size = 0.85

$$-\frac{\operatorname{Ci}\left(2\arcsin\left(ax\right)\right)}{2\,a^3}+\frac{\log\left(\arcsin\left(ax\right)\right)}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -1/2*cos_integral(2*arcsin(a*x))/a^3 + 1/2*log(arcsin(a*x))/a^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^2}{\operatorname{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.345 $\int \frac{x}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=9

$$\frac{\text{Si}(\text{ArcSin}(ax))}{a^2}$$

```
[Out] Si(arcsin(a*x))/a^2
```

Rubi [A]
time = 0.05, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {4809, 3380}

$$\frac{\text{Si}(\text{ArcSin}(ax))}{a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] SinIntegral[ArcSin[a*x]]/a^2
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a^2}\\ &= \frac{\text{Si}(\sin^{-1}(ax))}{a^2}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 9, normalized size = 1.00

$$\frac{\text{Si}(\text{ArcSin}(ax))}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] SinIntegral[ArcSin[a*x]]/a^2
```

Maple [A]
time = 0.11, size = 10, normalized size = 1.11

method	result	size
default	$\frac{\text{sinIntegral}(\arcsin(ax))}{a^2}$	10

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] Si(arcsin(a*x))/a^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [**A**]
time = 0.44, size = 9, normalized size = 1.00

$$\frac{\mathrm{Si}\left(\arcsin\left(ax\right)\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] sin_integral(arcsin(a*x))/a^2
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.11

$$\int \frac{x}{\mathrm{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] int(x/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.346 $\int \frac{1}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=9

$$\frac{\log(\mathrm{ArcSin}(ax))}{a}$$

```
[Out] ln(arcsin(a*x))/a
```

Rubi [A]
time = 0.02, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {4735}

$$\frac{\log(\mathrm{ArcSin}(ax))}{a}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Log[ArcSin[a*x]]/a
```

Rule 4735

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx=\frac{\log\left(\sin^{-1}(ax)\right)}{a}$$

Mathematica [A]
time = 0.01, size = 9, normalized size = 1.00

$$\frac{\log(\mathrm{ArcSin}(ax))}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Log[ArcSin[a*x]]/a
```

Maple [A]
time = 0.09, size = 10, normalized size = 1.11

method	result	size
derivativedivides	$\frac{\ln(\arcsin(ax))}{a}$	10
default	$\frac{\ln(\arcsin(ax))}{a}$	10

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] ln(arcsin(a*x))/a
```

Maxima [A]
time = 0.46, size = 9, normalized size = 1.00

$$\frac{\log(\arcsin(ax))}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] log(arcsin(a*x))/a
```

Fricas [A]
time = 1.73, size = 11, normalized size = 1.22

$$\frac{\log(-\arcsin(ax))}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] log(-arcsin(a*x))/a
```

Sympy [A]
time = 0.22, size = 7, normalized size = 0.78

$$\frac{\log(\operatorname{asin}(ax))}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] log(asin(a*x))/a
```

Giac [A]
time = 0.44, size = 10, normalized size = 1.11

$$\frac{\log(|\arcsin(ax)|)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] log(abs(arcsin(a*x)))/a
```

Mupad [B]
time = 0.15, size = 9, normalized size = 1.00

$$\frac{\ln\left(\mathrm{asin}(a\,x)\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] log(asin(a*x))/a
```

3.347 $\int \frac{1}{x\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)},x\right)$$

```
[Out] Unintegrable(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Defer[Int][1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx = \int \frac{1}{x\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx$$

Mathematica [A]
time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Integrate[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [A]
time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{1}{x\arcsin(ax)\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
[Out] int(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)/((a^2*x^3 - x)*arcsin(a*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x*sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x \operatorname{asin}(a x) \sqrt{1 - a^2 x^2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(1/(x*asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.348 $\int \frac{1}{x^2\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)},x\right)$$

```
[Out] Unintegrable(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Defer[Int][1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx = \int \frac{1}{x^2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx$$

Mathematica [A]
time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Integrate[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [A]
time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\arcsin(ax)\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
[Out] int(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)/((a^2*x^4 - x^2)*arcsin(a*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x**2*sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2 \operatorname{asin}(a x) \sqrt{1 - a^2 x^2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(1/(x^2*asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.349 $\int \frac{x^5}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$

Optimal. Leaf size=183

$$-\frac{5\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^6}+\frac{5\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^6}-\frac{\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(}{b}\right.}{16bc^6}$$

```
[Out] 5/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^6-5/16*cos(3*a/b)*Si(3*(a+b*arcsin
(c*x))/b)/b/c^6+1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^6-5/8*Ci((a+b
*arcsin(c*x))/b)*sin(a/b)/b/c^6+5/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b
/c^6-1/16*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^6
```

Rubi [A]

time = 0.24, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 3393, 3384, 3380, 3383}

$$-\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^6}+\frac{5\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^6}-\frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^6}+\frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^6}-\frac{5\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^6}+\frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^6}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b*c^6) + (5*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^6) - (CosIntegral[(5*(a +
 b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^6) + (5*Cos[a/b]*SinIntegral[(a +
 b*ArcSin[c*x])/b])/(8*b*c^6) - (5*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSi
n[c*x]))/b])/(16*b*c^6) + (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))
/b])/(16*b*c^6)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^5}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^5(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^6}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{5\sin(x)}{8(a+bx)} - \frac{5\sin(3x)}{16(a+bx)} + \frac{\sin(5x)}{16(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c^6}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^6} - \frac{5\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16c^6}$$
$$= \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^6} - \frac{\left(5\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\right.}{}$$
$$= -\frac{5\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^6} + \frac{5\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{16bc^6} - \frac{\text{Ci}\left(\right.}{}$$

Mathematica [A]
time = 0.21, size = 136, normalized size = 0.74

$$-\frac{10\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-5\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)+\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{5a}{b}\right)-10\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+5\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\cos\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16bc^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/16*(10*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 5*CosIntegral[3*(a/b +
ArcSin[c*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b
```

```
] - 10*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 5*Cos[(3*a)/b]*SinIntegral
[3*(a/b + ArcSin[c*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/
(b*c^6)
```

Maple [A]
time = 0.12, size = 139, normalized size = 0.76

method	result
default	$\frac{\mathrm{sinIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)-\mathrm{cosineIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)-5\,\mathrm{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)+5\,\mathrm{cosineIn}}{16c^6b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/16/c^6*(Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*
a/b)-5*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)+5*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a
/b)+10*Si(arcsin(c*x)+a/b)*cos(a/b)-10*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^5/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^5/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\sqrt{-(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**5/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^5/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.350 $\int \frac{x^4}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=144

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^5}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc^5}+\frac{3\log(a+b\text{ArcSin}(cx))}{8bc^5}-$$

```
[Out] -1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^5+1/8*Ci(4*(a+b*arcsin(c*x))/
b)*cos(4*a/b)/b/c^5+3/8*ln(a+b*arcsin(c*x))/b/c^5-1/2*Si(2*(a+b*arcsin(c*x)
)/b)*sin(2*a/b)/b/c^5+1/8*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^5
```

Rubi [A]
time = 0.21, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 3393, 3384, 3380, 3383}

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^5}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc^5}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^5}+\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8bc^5}+\frac{3\log(a+b\text{ArcSin}(cx))}{8bc^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/2*(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b*c^5) + (Cos[(
4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c^5) + (3*Log[a + b*Ar
cSin[c*x]])/(8*b*c^5) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b
])/(2*b*c^5) + (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c
^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^4}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}\,dx = \frac{\operatorname{Subst}\left(\int \frac{\sin^4(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^5}$$

$$= \frac{\operatorname{Subst}\left(\int \left(\frac{3}{8(a+bx)} - \frac{\cos(2x)}{2(a+bx)} + \frac{\cos(4x)}{8(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c^5}$$

$$= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc^5} + \frac{\operatorname{Subst}\left(\int \frac{\cos(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8c^5} - \frac{\operatorname{Subst}\left(\int\right.}{}$$

$$= \frac{3\log\left(a+b\sin^{-1}(cx)\right)}{8bc^5} - \frac{\cos\left(\frac{2a}{b}\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c^5}$$

$$= -\frac{\cos\left(\frac{2a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^5} + \frac{\cos\left(\frac{4a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)}{8bc^5} + \frac{3\,\mathrm{l}}{}$$

Mathematica [A]
time = 0.16, size = 108, normalized size = 0.75

$$\frac{-4\cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(2\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)+\cos\left(\frac{4a}{b}\right)\operatorname{CosIntegral}\left(4\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)+3\log(a+b\operatorname{ArcSin}(cx))-4\sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(2\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)+\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(4\left(\frac{a}{b}+\operatorname{ArcSin}(cx)\right)\right)}{8bc^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Cos[(4*a)/b]*CosInteg
ral[4*(a/b + ArcSin[c*x])] + 3*Log[a + b*ArcSin[c*x]] - 4*Sin[(2*a)/b]*SinI
ntegral[2*(a/b + ArcSin[c*x])] + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c
*x])])/(8*b*c^5)
```

Maple [A]
time = 0.09, size = 111, normalized size = 0.77

method	result
default	$\frac{\mathrm{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+\mathrm{cosineIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-4\,\mathrm{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)-4\,\mathrm{cosineInt}}{8c^5b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/8/c^5*(Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+Ci(4*arcsin(c*x)+4*a/b)*cos(4*a
/b)-4*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-4*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/
b)+3*ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^4/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^4/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\sqrt{-(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x**4/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.46, size = 254, normalized size = 1.76

$$\frac{\cos\left(\frac{a}{b}\right)^{4}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc^{5}}+\frac{\cos\left(\frac{a}{b}\right)^{3}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc^{5}}-\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc^{5}}+\frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{8bc^{5}}+\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{2bc^{5}}+\frac{3\log\left(b\arcsin\left(cx\right)+a\right)}{8bc^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + cos(a/b)^3*sin(a/b
)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) - cos(a/b)^2*cos_integral(4*a
/b + 4*arcsin(c*x))/(b*c^5) - cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x)
)/(b*c^5) - 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^
5) - cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^5) + 1/8*co
s_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + 1/2*cos_integral(2*a/b + 2*arcs
in(c*x))/(b*c^5) + 3/8*log(b*arcsin(c*x) + a)/(b*c^5)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^4/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.351 $\int \frac{x^3}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=121

$$-\frac{3\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4bc^4}+\frac{\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4bc^4}+\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^4}$$

```
[Out] 3/4*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4-1/4*cos(3*a/b)*Si(3*(a+b*arcsin(
c*x))/b)/b/c^4-3/4*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^4+1/4*Ci(3*(a+b*arc
sin(c*x))/b)*sin(3*a/b)/b/c^4
```

Rubi [A]
time = 0.21, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 3393, 3384, 3380, 3383}

$$-\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^4}+\frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4bc^4}+\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^4}-\frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4bc^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b*c^4) + (CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b*c^4) + (3*Cos[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(4*b*c^4) - (Cos[(3*a)/b]*SinIntegral[(3*(a + b*Ar
cSin[c*x]))/b])/(4*b*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^3}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^4} \\
&= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{4(a+bx)} - \frac{\sin(3x)}{4(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c^4} \\
&= -\frac{\text{Subst}\left(\int \frac{\sin(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^4} + \frac{3\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^4} \\
&= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4c^4} - \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin}{}\right.}{} \\
&= -\frac{3\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^4} + \frac{\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)\sin\left(\frac{3a}{b}\right)}{4bc^4} + \frac{3\cos}{}
\end{aligned}
$$

Mathematica [A]
time = 0.14, size = 92, normalized size = 0.76

$$
-\frac{3\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right) - \text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right) - 3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + \cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{4bc^4}
$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/4*(3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcS
in[c*x])]*Sin[(3*a)/b] - 3*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3
*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(b*c^4)
```

Maple [A]
time = 0.11, size = 93, normalized size = 0.77

method	result
default	$-\frac{\text{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-\text{cosineIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-3\,\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)+3\,\text{cosineInte}}{4c^4b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c^4*(Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-Ci(3*arcsin(c*x)+3*a/b)*sin(3*
a/b)-3*Si(arcsin(c*x)+a/b)*cos(a/b)+3*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\sqrt{-(cx-1)(cx+1)}\,(a+b\,\text{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^3/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.352 $\int \frac{x^2}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=82

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^3}+\frac{\log(a+b\text{ArcSin}(cx))}{2bc^3}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^3}$$

```
[Out] -1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^3+1/2*ln(a+b*arcsin(c*x))/b/c
^3-1/2*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^3
```

Rubi [A]

time = 0.16, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 3393, 3384, 3380, 3383}

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^3}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^3}+\frac{\log(a+b\text{ArcSin}(cx))}{2bc^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/2*(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b*c^3) + Log[a
+ b*ArcSin[c*x]]/(2*b*c^3) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x
]))/b])/(2*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3}\\ &= \frac{\text{Subst}\left(\int \left(\frac{1}{2(a+bx)}-\frac{\cos(2x)}{2(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{c^3}\\ &= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3}-\frac{\text{Subst}\left(\int \frac{\cos(2x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c^3}\\ &= \frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3}-\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2c^3}\\ &= -\frac{\cos\left(\frac{2a}{b}\right)\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)}{2bc^3}+\frac{\log\left(a+b\sin^{-1}(cx)\right)}{2bc^3}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\right.}{}\end{aligned}$$

Mathematica [A]
time = 0.11, size = 64, normalized size = 0.78

$$-\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-\log(a+b\text{ArcSin}(cx))+\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{2bc^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/2*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] - Log[a + b*ArcSin[c*
x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b*c^3)
```

Maple [A]
time = 0.10, size = 65, normalized size = 0.79

method	result	size
default	$\frac{-\operatorname{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)-\operatorname{cosineIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+\ln(a+b\arcsin(cx))}{2c^3b}$	65

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c^3*(-Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*cos(2*
a/b)+ln(a+b*arcsin(c*x)))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.45, size = 104, normalized size = 1.27

$$-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^3}-\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^3}+\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^3}+\frac{\log(b\arcsin(cx)+a)}{2bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) - cos(a/b)*sin(a/b)
*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) + 1/2*cos_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^3) + 1/2*log(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.353 $\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=54

$$-\frac{\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc^2}$$

```
[Out] cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2-Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
^2
```

Rubi [A]
time = 0.10, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {4809, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc^2}-\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^2)) + (Cos[a/b]*SinInt
egral[(a + b*ArcSin[c*x])/b])/(b*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
```

```
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^2}\\ &= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^2} - \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\right.}{c^2}\\ &= -\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{bc^2}\end{aligned}$$

Mathematica [A]
time = 0.08, size = 45, normalized size = 0.83

$$\frac{-\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)+\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)}{bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] (-(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b]) + Cos[a/b]*SinIntegral[a/b + Ar
cSin[c*x]])/(b*c^2)
```

Maple [A]
time = 0.09, size = 46, normalized size = 0.85

method	result	size
default	$\frac{\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{c^2 b}$	46

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/c^2*(Si(arcsin(c*x)+a/b)*cos(a/b)-Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) - a
), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.44, size = 50, normalized size = 0.93

$$-\frac{\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)*sin_integral(a
/b + arcsin(c*x))/(b*c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{(a+b\operatorname{asin}(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.354 $\int \frac{1}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=16

$$\frac{\log(a+b\text{ArcSin}(cx))}{bc}$$

[Out] ln(a+b*arcsin(c*x))/b/c

Rubi [A]
time = 0.03, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {4735}

$$\frac{\log(a+b\text{ArcSin}(cx))}{bc}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]

[Out] Log[a + b*ArcSin[c*x]]/(b*c)

Rule 4735

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}\,dx = \frac{\log\left(a+b\sin^{-1}(cx)\right)}{bc}$$

Mathematica [A]
time = 0.03, size = 16, normalized size = 1.00

$$\frac{\log(a+b\text{ArcSin}(cx))}{bc}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]

[Out] Log[a + b*ArcSin[c*x]]/(b*c)

Maple [A]
time = 0.09, size = 17, normalized size = 1.06

method	result	size
derivativedivides	$\frac{\ln(a+b\arcsin(cx))}{bc}$	17
default	$\frac{\ln(a+b\arcsin(cx))}{bc}$	17

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] ln(a+b*arcsin(c*x))/b/c
```

Maxima [A]
time = 0.46, size = 16, normalized size = 1.00

$$\frac{\log\left(b\arcsin\left(cx\right)+a\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] log(b*arcsin(c*x) + a)/(b*c)
```

Fricas [A]
time = 1.91, size = 19, normalized size = 1.19

$$\frac{\log\left(-b\arcsin\left(cx\right)-a\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] log(-b*arcsin(c*x) - a)/(b*c)
```

Sympy [C] Result contains complex when optimal does not.
time = 0.84, size = 42, normalized size = 2.62

$$\begin{cases} \frac{x}{a} & \text{for } c=0 \wedge (b=0 \vee c=0) \\ \frac{\begin{cases} -\frac{i\operatorname{acosh}(cx)}{c} & \text{for } |c^2x^2|>1 \\ \frac{\operatorname{asin}(cx)}{c} & \text{otherwise} \end{cases}}{a} & \text{for } b=0 \\ \frac{\log\left(\frac{a}{b}+\operatorname{asin}(cx)\right)}{bc} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x/a, Eq(c, 0) & (Eq(b, 0) | Eq(c, 0))), (Piecewise((-I*acosh(c*x
)/c, Abs(c**2*x**2) > 1), (asin(c*x)/c, True))/a, Eq(b, 0)), (log(a/b + asi
n(c*x))/(b*c), True))
```

Giac [A]
time = 0.44, size = 17, normalized size = 1.06

$$\frac{\log\left(\left|b\arcsin\left(cx\right)+a\right|\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] log(abs(b*arcsin(c*x) + a))/(b*c)
```

Mupad [B]
time = 0.18, size = 16, normalized size = 1.00

$$\frac{\ln\left(a+b\,\mathrm{asin}(c\,x)\right)}{b\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] log(a + b*asin(c*x))/(b*c)
```

3.355 $\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left(\frac{1}{x\sqrt{1-c^2x^2}\,(a+b\operatorname{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\operatorname{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 1.89, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\operatorname{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{1}{x\,(a+b\arcsin(cx))\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^2*x^3 - a*x + (b*c^2*x^3 - b*x)*arcsin(c*
x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{-\left(cx-1\right)\left(cx+1\right)}\,\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.356 $\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\mathrm{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\,(a+b\arcsin(cx))\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
[Out] int(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^2*x^4 - a*x^2 + (b*c^2*x^4 - b*x^2)*arcsi
n(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x**2*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.357 $\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))},x\right)$$

[Out] Unintegrable(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

[In] Int[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]

Rubi steps

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 2.78, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

[In] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]

[Out] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]

Maple [A]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b
*c^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{(a+b\operatorname{asin}(c\,x))\,\left(1-c^2\,x^2\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.358 $\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx = \int \frac{x}{(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 6.86, size = 0, normalized size = 0.00

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.31, size = 0, normalized size = 0.00

$$\int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c
^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(1-c^2\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.359 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$

Optimal. Leaf size=28

$$\text{Int}\left(\frac{1}{\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{\left(1-c^2x^2\right)^{3/2}(a+b\sin^{-1}(cx))}\,dx=\int \frac{1}{\left(1-c^2x^2\right)^{3/2}(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2
*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\operatorname{asin}(cx))\,(1-c^2x^2)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.360 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))},x\right)$$

[Out] Unintegrable(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

[In] Int[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 1.87, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

[In] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]

[Out] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]

Maple [A]
time = 2.06, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-c^2x^2+1\right)^{\frac{3}{2}}(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^5 - 2*a*c^2*x^3 + a*x + (b*c^4*x^5 - 2
*b*c^2*x^3 + b*x)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.361 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))} dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 1.35, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^6 - 2*a*c^2*x^4 + a*x^2 + (b*c^4*x^6 -
 2*b*c^2*x^4 + b*x^2)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2}\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2 \ (a + b \operatorname{asin}(c x)) \ (1 - c^2 x^2)^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.362 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 3.03, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 2.36, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (
b*c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(-(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{(a + b \operatorname{asin}(c x)) (1 - c^2 x^2)^{5/2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.363 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))} dx = \int \frac{x}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))} dx$$

Mathematica [A]
time = 17.10, size = 0, normalized size = 0.00

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 1.99, size = 0, normalized size = 0.00

$$\int \frac{x}{(-c^2x^2+1)^{\frac{5}{2}}(a+b\arcsin(cx))} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(x/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (b*
c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(1-c^2\,x^2\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.364 $\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=28

$$\text{Int}\left(\frac{1}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 1.38, size = 0, normalized size = 0.00

$$\int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (b*c^
6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a + b\,\mathrm{asin}\,(c\,x))\,\left(1 - c^2\,x^2\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.365 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))} \, dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))} \, dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)} \, dx = \int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)} \, dx$$

Mathematica [A]
time = 4.06, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))} \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 3.93, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^7 - 3*a*c^4*x^5 + 3*a*c^2*x^3 - a*x +
 (b*c^6*x^7 - 3*b*c^4*x^5 + 3*b*c^2*x^3 - b*x)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(1-c^2\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.366 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))},x\right)$$

[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

[In] Int[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]

[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx=\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 3.80, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

[In] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]

[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]

Maple [A]
time = 4.14, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^8 - 3*a*c^4*x^6 + 3*a*c^2*x^4 - a*x^2
 + (b*c^6*x^8 - 3*b*c^4*x^6 + 3*b*c^2*x^4 - b*x^2)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}} \left(a+b \operatorname{asin}\left(cx\right)\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2 \left(a+b \operatorname{asin}\left(c\,x\right)\right) \left(1-c^2\,x^2\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.367 $\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx = \int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A]
time = 0.65, size = 0, normalized size = 0.00

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\text{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
[Out] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]), x]
```

Maple [A]
time = 2.05, size = 0, normalized size = 0.00

$$\int \frac{x^m(-c^2x^2+1)^{\frac{5}{2}}}{a+b\arcsin(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^m/(b*arcsin(c*x) + a), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) +
a), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\left(1-c^2\,x^2\right)^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
[Out] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.368 $\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx = \int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A]
time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\text{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
[Out] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]), x]
```

Maple [A]
time = 1.88, size = 0, normalized size = 0.00

$$\int \frac{x^m(-c^2x^2+1)^{\frac{3}{2}}}{a+b\arcsin(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^m/(b*arcsin(c*x) + a), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m(-(cx-1)(cx+1))^{\frac{3}{2}}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**m*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\left(1-c^2\,x^2\right)^{3/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
[Out] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.369 $\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left(\frac{x^m\sqrt{1-c^2x^2}}{a+b\operatorname{ArcSin}(cx)},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\operatorname{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx=\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\operatorname{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
[Out] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]), x]
```

Maple [A]
time = 1.82, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{-c^2x^2+1}}{a+b\arcsin\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{-\left(cx-1\right)\left(cx+1\right)}}{a+b\operatorname{asin}\left(cx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m \sqrt{1-c^2 x^2}}{a+b \operatorname{asin}(c x)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
[Out] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.370 $\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.61, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{-c^2x^2+1}\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{(a + b\,\mathrm{asin}\,(c\,x))\,\sqrt{1 - c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.371 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.92, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b
*c^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^m}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{(a+b\operatorname{asin}(c\,x))\,\left(1-c^2\,x^2\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.372 $\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left(\frac{x^m}{\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 1.25, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (
b*c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(1-c^2\,x^2\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.373 $\int \frac{x^m}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)},x\right)$$

```
[Out] Unintegrable(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Defer[Int][x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx = \int \frac{x^m}{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}\,dx$$

Mathematica [A]
time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Integrate[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [A]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\arcsin\left(ax\right)\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}\,\operatorname{asin}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\operatorname{asin}(a\,x)\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^m/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.374 $\int \frac{(c-a^2cx^2)^3}{\mathbf{ArcSin}(ax)^2}\,dx$

Optimal. Leaf size=95

$$-\frac{c^3(1-a^2x^2)^{7/2}}{a\text{ArcSin}(ax)}-\frac{35c^3\text{Si}(\text{ArcSin}(ax))}{64a}-\frac{63c^3\text{Si}(3\text{ArcSin}(ax))}{64a}-\frac{35c^3\text{Si}(5\text{ArcSin}(ax))}{64a}-\frac{7c^3\text{Si}(7\text{ArcSin}(ax))}{64a}$$

```
[Out] -c^3*(-a^2*x^2+1)^(7/2)/a/arcsin(a*x)-35/64*c^3*Si(arcsin(a*x))/a-63/64*c^3
*Si(3*arcsin(a*x))/a-35/64*c^3*Si(5*arcsin(a*x))/a-7/64*c^3*Si(7*arcsin(a*x
))/a
```

Rubi [A]
time = 0.12, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4751, 4809, 4491, 3380}

$$-\frac{c^3(1-a^2x^2)^{7/2}}{a\text{ArcSin}(ax)}-\frac{35c^3\text{Si}(\text{ArcSin}(ax))}{64a}-\frac{63c^3\text{Si}(3\text{ArcSin}(ax))}{64a}-\frac{35c^3\text{Si}(5\text{ArcSin}(ax))}{64a}-\frac{7c^3\text{Si}(7\text{ArcSin}(ax))}{64a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^3/ArcSin[a*x]^2,x]
```

```
[Out] -((c^3*(1 - a^2*x^2)^(7/2))/(a*ArcSin[a*x])) - (35*c^3*SinIntegral[ArcSin[a
*x]])/(64*a) - (63*c^3*SinIntegral[3*ArcSin[a*x]])/(64*a) - (35*c^3*SinInte
gral[5*ArcSin[a*x]])/(64*a) - (7*c^3*SinIntegral[7*ArcSin[a*x]])/(64*a)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^3}{\sin^{-1}(ax)^2}\,dx = -\frac{c^3(1-a^2x^2)^{7/2}}{a\sin^{-1}(ax)} - (7ac^3)\int \frac{x(1-a^2x^2)^{5/2}}{\sin^{-1}(ax)}\,dx$$
$$= -\frac{c^3(1-a^2x^2)^{7/2}}{a\sin^{-1}(ax)} - \frac{(7c^3)\,\text{Subst}\left(\int \frac{\cos^6(x)\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a}$$
$$= -\frac{c^3(1-a^2x^2)^{7/2}}{a\sin^{-1}(ax)} - \frac{(7c^3)\,\text{Subst}\left(\int \left(\frac{5\sin(x)}{64x} + \frac{9\sin(3x)}{64x} + \frac{5\sin(5x)}{64x} + \frac{\sin(7x)}{64x}\right)dx, x, \sin^{-1}(ax\right.}{a}$$
$$= -\frac{c^3(1-a^2x^2)^{7/2}}{a\sin^{-1}(ax)} - \frac{(7c^3)\,\text{Subst}\left(\int \frac{\sin(7x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{64a} - \frac{(35c^3)\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x\right.}{64a}$$
$$= -\frac{c^3(1-a^2x^2)^{7/2}}{a\sin^{-1}(ax)} - \frac{35c^3\text{Si}(\sin^{-1}(ax))}{64a} - \frac{63c^3\text{Si}(3\sin^{-1}(ax))}{64a} - \frac{35c^3\text{Si}(5\sin^{-1}(ax))}{64a} -$$

Mathematica [A]
time = 0.29, size = 83, normalized size = 0.87

$$-\frac{c^3\left(64(1-a^2x^2)^{7/2} + 35\text{ArcSin}(ax)\text{Si}(\text{ArcSin}(ax)) + 63\text{ArcSin}(ax)\text{Si}(3\text{ArcSin}(ax)) + 35\text{ArcSin}(ax)\text{Si}(5\text{ArcSin}(ax)) + 7\text{ArcSin}(ax)\text{Si}(7\text{ArcSin}(ax))\right)}{64a\text{ArcSin}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^3/ArcSin[a*x]^2,x]
```

```
[Out] -1/64*(c^3*(64*(1 - a^2*x^2)^(7/2) + 35*ArcSin[a*x]*SinIntegral[ArcSin[a*x]
] + 63*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]] + 35*ArcSin[a*x]*SinIntegral[
5*ArcSin[a*x]] + 7*ArcSin[a*x]*SinIntegral[7*ArcSin[a*x]]))/(a*ArcSin[a*x])
```

Maple [A]
time = 0.24, size = 105, normalized size = 1.11

method	result
derivativedivides	$-\frac{c^3\left(35\,\text{sinIntegral}(\arcsin(ax))\arcsin(ax)+63\,\text{sinIntegral}(3\arcsin(ax))\arcsin(ax)+35\,\text{sinIntegral}(5\arcsin(ax))\arcsin(a\right.}{64a}$

default	$-\frac{c^{3}\left(35\,\mathrm{sinIntegral}(\arcsin(ax))\arcsin(ax)+63\,\mathrm{sinIntegral}(3\arcsin(ax))\arcsin(ax)+35\,\mathrm{sinIntegral}(5\arcsin(ax))\arcsin\right.}{6}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/64/a*c^3*(35*Si(arcsin(a*x))*arcsin(a*x)+63*Si(3*arcsin(a*x))*arcsin(a*x
)+35*Si(5*arcsin(a*x))*arcsin(a*x)+7*Si(7*arcsin(a*x))*arcsin(a*x)+35*(-a^2
*x^2+1)^(1/2)+21*cos(3*arcsin(a*x))+7*cos(5*arcsin(a*x))+cos(7*arcsin(a*x))
)/arcsin(a*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(7*(a^5*c^3*x^5 - 2
*a^3*c^3*x^3 + a*c^3*x)*sqrt(a*x + 1)*sqrt(-a*x + 1)/arctan2(a*x, sqrt(a*x
+ 1)*sqrt(-a*x + 1)), x) - (a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c
^3)*sqrt(a*x + 1)*sqrt(-a*x + 1))/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x +
 1)))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)/arcsin(a*x)^2
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-c^{3}\left(\int \frac{3a^{2}x^{2}}{\operatorname{asin}^{2}(ax)}\,dx+\int \left(-\frac{3a^{4}x^{4}}{\operatorname{asin}^{2}(ax)}\right)dx+\int \frac{a^{6}x^{6}}{\operatorname{asin}^{2}(ax)}\,dx+\int \left(-\frac{1}{\operatorname{asin}^{2}(ax)}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**3/asin(a*x)**2,x)
```

```
[Out] -c**3*(Integral(3*a**2*x**2/asin(a*x)**2, x) + Integral(-3*a**4*x**4/asin(a
*x)**2, x) + Integral(a**6*x**6/asin(a*x)**2, x) + Integral(-1/asin(a*x)**2
, x))
```

Giac [A]
time = 0.48, size = 95, normalized size = 1.00

$$\frac{(a^2x^2-1)^3\sqrt{-a^2x^2+1}\,c^3}{a\arcsin(ax)}-\frac{7\,c^3\,\mathrm{Si}\,(7\,\arcsin(ax))}{64\,a}-\frac{35\,c^3\,\mathrm{Si}\,(5\,\arcsin(ax))}{64\,a}-\frac{63\,c^3\,\mathrm{Si}\,(3\,\arcsin(ax))}{64\,a}-\frac{35\,c^3\,\mathrm{Si}\,(\arcsin(ax))}{64\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] (a^2*x^2 - 1)^3*sqrt(-a^2*x^2 + 1)*c^3/(a*arcsin(a*x)) - 7/64*c^3*sin_integ
ral(7*arcsin(a*x))/a - 35/64*c^3*sin_integral(5*arcsin(a*x))/a - 63/64*c^3*
sin_integral(3*arcsin(a*x))/a - 35/64*c^3*sin_integral(arcsin(a*x))/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(c-a^2\,c\,x^2\right)}^3}{{\mathrm{asin}\left(a\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^3/asin(a*x)^2,x)
```

```
[Out] int((c - a^2*c*x^2)^3/asin(a*x)^2, x)
```

3.375 $\int \frac{(c-a^2cx^2)^2}{\text{ArcSin}(ax)^2} dx$

Optimal. Leaf size=78

$$-\frac{c^2(1-a^2x^2)^{5/2}}{a\text{ArcSin}(ax)}-\frac{5c^2\text{Si}(\text{ArcSin}(ax))}{8a}-\frac{15c^2\text{Si}(3\text{ArcSin}(ax))}{16a}-\frac{5c^2\text{Si}(5\text{ArcSin}(ax))}{16a}$$

```
[Out] -c^2*(-a^2*x^2+1)^(5/2)/a/arcsin(a*x)-5/8*c^2*Si(arcsin(a*x))/a-15/16*c^2*S
i(3*arcsin(a*x))/a-5/16*c^2*Si(5*arcsin(a*x))/a
```

Rubi [A]
time = 0.11, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4751, 4809, 4491, 3380}

$$-\frac{c^2(1-a^2x^2)^{5/2}}{a\text{ArcSin}(ax)}-\frac{5c^2\text{Si}(\text{ArcSin}(ax))}{8a}-\frac{15c^2\text{Si}(3\text{ArcSin}(ax))}{16a}-\frac{5c^2\text{Si}(5\text{ArcSin}(ax))}{16a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^2/ArcSin[a*x]^2,x]
```

```
[Out] -((c^2*(1 - a^2*x^2)^(5/2))/(a*ArcSin[a*x])) - (5*c^2*SinIntegral[ArcSin[a*
x]])/(8*a) - (15*c^2*SinIntegral[3*ArcSin[a*x]])/(16*a) - (5*c^2*SinIntegra
l[5*ArcSin[a*x]])/(16*a)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{(c-a^2cx^2)^2}{\sin^{-1}(ax)^2}\,dx &= -\frac{c^2(1-a^2x^2)^{5/2}}{a\sin^{-1}(ax)} - (5ac^2)\int \frac{x(1-a^2x^2)^{3/2}}{\sin^{-1}(ax)}\,dx \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\sin^{-1}(ax)} - \frac{(5c^2)\,\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{a} \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\sin^{-1}(ax)} - \frac{(5c^2)\,\text{Subst}\left(\int \left(\frac{\sin(x)}{8x}+\frac{3\sin(3x)}{16x}+\frac{\sin(5x)}{16x}\right)dx, x, \sin^{-1}(ax)\right)}{a} \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\sin^{-1}(ax)} - \frac{(5c^2)\,\text{Subst}\left(\int \frac{\sin(5x)}{x}\,dx, x, \sin^{-1}(ax)\right)}{16a} - \frac{(5c^2)\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \right.}{8a} \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\sin^{-1}(ax)} - \frac{5c^2\text{Si}(\sin^{-1}(ax))}{8a} - \frac{15c^2\text{Si}(3\sin^{-1}(ax))}{16a} - \frac{5c^2\text{Si}(5\sin^{-1}(ax))}{16a}
\end{aligned}$$

Mathematica [A]
time = 0.19, size = 70, normalized size = 0.90

$$-\frac{c^2\left(16(1-a^2x^2)^{5/2}+10\text{ArcSin}(ax)\text{Si}(\text{ArcSin}(ax))+15\text{ArcSin}(ax)\text{Si}(3\text{ArcSin}(ax))+5\text{ArcSin}(ax)\text{Si}(5\text{ArcSin}(ax))\right)}{16a\text{ArcSin}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^2/ArcSin[a*x]^2,x]
```

```
[Out] -1/16*(c^2*(16*(1 - a^2*x^2)^(5/2) + 10*ArcSin[a*x]*SinIntegral[ArcSin[a*x]
] + 15*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]] + 5*ArcSin[a*x]*SinIntegral[5
*ArcSin[a*x]]))/(a*ArcSin[a*x])
```

Maple [A]
time = 0.10, size = 83, normalized size = 1.06

method	result

derivativedivides	$-\frac{c^2\left(10\,\mathrm{sinIntegral}(\arcsin(ax))\arcsin(ax)+15\,\mathrm{sinIntegral}(3\arcsin(ax))\arcsin(ax)+5\,\mathrm{sinIntegral}(5\arcsin(ax))\arcsin(\right.}{16a\arcsin(ax)}$
default	$-\frac{c^2\left(10\,\mathrm{sinIntegral}(\arcsin(ax))\arcsin(ax)+15\,\mathrm{sinIntegral}(3\arcsin(ax))\arcsin(ax)+5\,\mathrm{sinIntegral}(5\arcsin(ax))\arcsin(\right.}{16a\arcsin(ax)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/a*c^2*(10*Si(arcsin(a*x))*arcsin(a*x)+15*Si(3*arcsin(a*x))*arcsin(a*x
)+5*Si(5*arcsin(a*x))*arcsin(a*x)+10*(-a^2*x^2+1)^(1/2)+5*cos(3*arcsin(a*x)
)+cos(5*arcsin(a*x)))/arcsin(a*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] (a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(5*(a^3*c^2*x^3 - a*
c^2*x)*sqrt(a*x + 1)*sqrt(-a*x + 1)/arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x +
1)), x) - (a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*sqrt(a*x + 1)*sqrt(-a*x + 1))
/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)/arcsin(a*x)^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int\left(-\frac{2a^2x^2}{\operatorname{asin}^2(ax)}\right)dx+\int\frac{a^4x^4}{\operatorname{asin}^2(ax)}\,dx+\int\frac{1}{\operatorname{asin}^2(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**2/asin(a*x)**2,x)
```

```
[Out] c**2*(Integral(-2*a**2*x**2/asin(a*x)**2, x) + Integral(a**4*x**4/asin(a*x)
**2, x) + Integral(asin(a*x)**(-2), x))
```

Giac [A]
time = 0.48, size = 81, normalized size = 1.04

$$-\frac{\left(a^{2} x^{2}-1\right)^{2} \sqrt{-a^{2} x^{2}+1}\, c^{2}}{a \arcsin \left(a x\right)}-\frac{5\, c^{2} \operatorname{Si}\left(5\, \arcsin \left(a x\right)\right)}{16\, a}-\frac{15\, c^{2} \operatorname{Si}\left(3\, \arcsin \left(a x\right)\right)}{16\, a}-\frac{5\, c^{2} \operatorname{Si}\left(\arcsin \left(a x\right)\right)}{8\, a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] -(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^2/(a*arcsin(a*x)) - 5/16*c^2*sin_inte
gral(5*arcsin(a*x))/a - 15/16*c^2*sin_integral(3*arcsin(a*x))/a - 5/8*c^2*s
in_integral(arcsin(a*x))/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(c-a^2\,c\,x^2\right)}^2}{{\mathrm{asin}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^2/asin(a*x)^2,x)
```

```
[Out] int((c - a^2*c*x^2)^2/asin(a*x)^2, x)
```

3.376 $\int \frac{c-a^2cx^2}{\mathbf{ArcSin}(ax)^2} dx$

Optimal. Leaf size=55

$$-\frac{c(1-a^2x^2)^{3/2}}{a\text{ArcSin}(ax)}-\frac{3c\text{Si}(\text{ArcSin}(ax))}{4a}-\frac{3c\text{Si}(3\text{ArcSin}(ax))}{4a}$$

```
[Out] -c*(-a^2*x^2+1)^(3/2)/a/arcsin(a*x)-3/4*c*Si(arcsin(a*x))/a-3/4*c*Si(3*arcs
in(a*x))/a
```

Rubi [A]
time = 0.09, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4751, 4809, 4491, 3380}

$$-\frac{c(1-a^2x^2)^{3/2}}{a\text{ArcSin}(ax)}-\frac{3c\text{Si}(\text{ArcSin}(ax))}{4a}-\frac{3c\text{Si}(3\text{ArcSin}(ax))}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)/ArcSin[a*x]^2,x]
```

```
[Out] -((c*(1 - a^2*x^2)^(3/2))/(a*ArcSin[a*x])) - (3*c*SinIntegral[ArcSin[a*x]])
/(4*a) - (3*c*SinIntegral[3*ArcSin[a*x]])/(4*a)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{c-a^2cx^2}{\sin^{-1}(ax)^2}\,dx &= -\frac{c(1-a^2x^2)^{3/2}}{a\sin^{-1}(ax)}-(3ac)\int \frac{x\sqrt{1-a^2x^2}}{\sin^{-1}(ax)}\,dx\\ &= -\frac{c(1-a^2x^2)^{3/2}}{a\sin^{-1}(ax)}-\frac{(3c)\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{a}\\ &= -\frac{c(1-a^2x^2)^{3/2}}{a\sin^{-1}(ax)}-\frac{(3c)\text{Subst}\left(\int \left(\frac{\sin(x)}{4x}+\frac{\sin(3x)}{4x}\right)\,dx,x,\sin^{-1}(ax)\right)}{a}\\ &= -\frac{c(1-a^2x^2)^{3/2}}{a\sin^{-1}(ax)}-\frac{(3c)\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{4a}-\frac{(3c)\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx,x,\sin^{-1}(ax)\right)}{4a}\\ &= -\frac{c(1-a^2x^2)^{3/2}}{a\sin^{-1}(ax)}-\frac{3c\text{Si}(\sin^{-1}(ax))}{4a}-\frac{3c\text{Si}(3\sin^{-1}(ax))}{4a}\end{aligned}$$

Mathematica [A]
time = 0.15, size = 55, normalized size = 1.00

$$-\frac{c\left(4(1-a^2x^2)^{3/2}+3\text{ArcSin}(ax)\text{Si}(\text{ArcSin}(ax))+3\text{ArcSin}(ax)\text{Si}(3\text{ArcSin}(ax))\right)}{4a\text{ArcSin}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)/ArcSin[a*x]^2,x]
```

```
[Out] -1/4*(c*(4*(1 - a^2*x^2)^(3/2) + 3*ArcSin[a*x]*SinIntegral[ArcSin[a*x]] + 3
*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]]))/(a*ArcSin[a*x])
```

Maple [A]
time = 0.06, size = 59, normalized size = 1.07

method	result
derivativedivides	$-\frac{c\left(3\,\text{sinIntegral}(\arcsin(ax))\arcsin(ax)+3\,\text{sinIntegral}(3\arcsin(ax))\arcsin(ax)+3\sqrt{-a^2x^2+1}+\cos(3\arcsin(ax))\right)}{4a\arcsin(ax)}$

default	$-\frac{c\left(3\,\mathrm{sinIntegral}(\arcsin(ax))\arcsin(ax)+3\,\mathrm{sinIntegral}(3\arcsin(ax))\arcsin(ax)+3\sqrt{-a^{2}x^{2}+1}+\cos(3\arcsin(ax)\right.}{4a\arcsin(ax)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)/arcsin(a*x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/a*c*(3*Si(arcsin(a*x))*arcsin(a*x)+3*Si(3*arcsin(a*x))*arcsin(a*x)+3*(
-a^2*x^2+1)^(1/2)+cos(3*arcsin(a*x)))/arcsin(a*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(3*a^2*c*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(sqrt(a*x + 1
)*sqrt(-a*x + 1)*x/arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)), x) - (a^2*c*
x^2 - c)*sqrt(a*x + 1)*sqrt(-a*x + 1))/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-
a*x + 1)))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c*x^2 - c)/arcsin(a*x)^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-c\left(\int \frac{a^{2}x^{2}}{\operatorname{asin}^{2}(ax)}\,dx+\int\left(-\frac{1}{\operatorname{asin}^{2}(ax)}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)/asin(a*x)**2,x)
```

```
[Out] -c*(Integral(a**2*x**2/asin(a*x)**2, x) + Integral(-1/asin(a*x)**2, x))
```

Giac [A]
time = 0.46, size = 49, normalized size = 0.89

$$-\frac{3\,c\,\mathrm{Si}\left(3\,\arcsin\left(ax\right)\right)}{4\,a}-\frac{3\,c\,\mathrm{Si}\left(\arcsin\left(ax\right)\right)}{4\,a}-\frac{\left(-a^{2}x^{2}+1\right)^{\frac{3}{2}}c}{a\arcsin\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] -3/4*c*sin_integral(3*arcsin(a*x))/a - 3/4*c*sin_integral(arcsin(a*x))/a -
(-a^2*x^2 + 1)^(3/2)*c/(a*arcsin(a*x))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{c-a^2\,c\,x^2}{\mathrm{asin}\left(a\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)/asin(a*x)^2,x)
```

```
[Out] int((c - a^2*c*x^2)/asin(a*x)^2, x)
```

3.377 $\int \frac{1}{(c-a^2cx^2)\mathbf{ArcSin}(ax)^2}\,dx$

Optimal. Leaf size=59

$$-\frac{1}{ac\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)}+\frac{a\mathrm{Int}\left(\frac{x}{(1-a^2x^2)^{3/2}\mathrm{ArcSin}(ax)},x\right)}{c}$$

```
[Out] -1/a/c/arcsin(a*x)/(-a^2*x^2+1)^(1/2)+a*Unintegrable(x/(-a^2*x^2+1)^(3/2)/a
rcsin(a*x),x)/c
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)\,\mathrm{ArcSin}(ax)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)*ArcSin[a*x]^2),x]
```

```
[Out] -(1/(a*c*Sqrt[1 - a^2*x^2]*ArcSin[a*x])) + (a*Defer[Int][x/((1 - a^2*x^2)^(
3/2)*ArcSin[a*x]), x])/c
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)\sin^{-1}(ax)^2}\,dx = -\frac{1}{ac\sqrt{1-a^2x^2}\,\sin^{-1}(ax)}+\frac{a\int \frac{x}{(1-a^2x^2)^{3/2}\sin^{-1}(ax)}\,dx}{c}$$

Mathematica [A]
time = 2.64, size = 0, normalized size = 0.00

$$\int \frac{1}{(c-a^2cx^2)\,\mathrm{ArcSin}(ax)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]^2),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]^2), x]
```

Maple [A]
time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{1}{(-a^2c\,x^2+c)\arcsin(ax)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x)
```

```
[Out] int(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] ((a^4*c*x^2 - a^2*c)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(s
qrt(a*x + 1)*sqrt(-a*x + 1)*x/((a^4*c*x^4 - 2*a^2*c*x^2 + c)*arctan2(a*x, s
qrt(a*x + 1)*sqrt(-a*x + 1))), x) + sqrt(a*x + 1)*sqrt(-a*x + 1))/((a^3*c*x
^2 - a*c)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(-1/((a^2*c*x^2 - c)*arcsin(a*x)^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{a^{2}x^{2}\operatorname{asin}^{2}(ax)-\operatorname{asin}^{2}(ax)}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)/asin(a*x)**2,x)
```

```
[Out] -Integral(1/(a**2*x**2*asin(a*x)**2 - asin(a*x)**2), x)/c
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(-1/((a^2*c*x^2 - c)*arcsin(a*x)^2), x)
```

Mupad [A]

time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\operatorname{asin}\left(a\,x\right)^2\,\left(c-a^2\,c\,x^2\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^2*(c - a^2*c*x^2)),x)
[Out] int(1/(asin(a*x)^2*(c - a^2*c*x^2)), x)
```

3.378 $\int \frac{1}{(c-a^2cx^2)^2 \mathbf{ArcSin}(ax)^2} dx$

Optimal. Leaf size=60

$$-\frac{1}{ac^2(1-a^2x^2)^{3/2}\operatorname{ArcSin}(ax)}+\frac{3a\text{Int}\left(\frac{x}{(1-a^2x^2)^{5/2}\operatorname{ArcSin}(ax)},x\right)}{c^2}$$

```
[Out] -1/a/c^2/(-a^2*x^2+1)^(3/2)/arcsin(a*x)+3*a*Unintegrable(x/(-a^2*x^2+1)^(5/
2)/arcsin(a*x),x)/c^2
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^2\operatorname{ArcSin}(ax)^2} dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[a*x])) + (3*a*Defer[Int][x/((1 - a^2*
x^2)^(5/2)*ArcSin[a*x]), x])/c^2
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)^2\sin^{-1}(ax)^2} dx = -\frac{1}{ac^2(1-a^2x^2)^{3/2}\sin^{-1}(ax)}+\frac{(3a)\int \frac{x}{(1-a^2x^2)^{5/2}\sin^{-1}(ax)} dx}{c^2}$$

Mathematica [A]
time = 9.96, size = 0, normalized size = 0.00

$$\int \frac{1}{(c-a^2cx^2)^2\operatorname{ArcSin}(ax)^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2), x]
```

Maple [A]
time = 1.07, size = 0, normalized size = 0.00

$$\int \frac{1}{(-a^2c\,x^2+c)^2\arcsin(ax)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(3*(a^6*c^2*x^4 - 2*a^4*c^2*x^2 + a^2*c^2)*arctan2(a*x, sqrt(a*x + 1)*sqrt
(-a*x + 1))*integrate(sqrt(a*x + 1)*sqrt(-a*x + 1)*x/((a^6*c^2*x^6 - 3*a^4*
c^2*x^4 + 3*a^2*c^2*x^2 - c^2)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))),
 x) + sqrt(a*x + 1)*sqrt(-a*x + 1))/((a^5*c^2*x^4 - 2*a^3*c^2*x^2 + a*c^2)*
arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*arcsin(a*x)^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4}x^{4}\operatorname{asin}^{2}(ax) - 2a^{2}x^{2}\operatorname{asin}^{2}(ax) + \operatorname{asin}^{2}(ax)}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**2/asin(a*x)**2,x)
```

```
[Out] Integral(1/(a**4*x**4*asin(a*x)**2 - 2*a**2*x**2*asin(a*x)**2 + asin(a*x)**
2), x)/c**2
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\operatorname{asin}(a\,x)^2\,{\left(c-a^2\,c\,x^2\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^2*(c - a^2*c*x^2)^2),x)
```

```
[Out] int(1/(asin(a*x)^2*(c - a^2*c*x^2)^2), x)
```

3.379 $\int \left(\frac{1}{(1-x^2)\mathbf{ArcSin}(x)^2}-\frac{x}{(1-x^2)^{3/2}\mathbf{ArcSin}(x)}\right)\,dx$

Optimal. Leaf size=17

$$-\frac{1}{\sqrt{1-x^2}\,\mathrm{ArcSin}(x)}$$

```
[Out] -1/arcsin(x)/(-x^2+1)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.030, Rules used = {4751}

$$-\frac{1}{\sqrt{1-x^2}\,\mathrm{ArcSin}(x)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((1 - x^2)*ArcSin[x]^2) - x/((1 - x^2)^(3/2)*ArcSin[x]),x]
```

```
[Out] -(1/(Sqrt[1 - x^2]*ArcSin[x]))
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{1}{(1-x^2)\sin^{-1}(x)^2}-\frac{x}{(1-x^2)^{3/2}\sin^{-1}(x)}\right)dx &= \int \frac{1}{(1-x^2)\sin^{-1}(x)^2}\,dx-\int \frac{x}{(1-x^2)^{3/2}\sin^{-1}(x)}\,dx\\ &= -\frac{1}{\sqrt{1-x^2}\,\sin^{-1}(x)}\end{aligned}$$

Mathematica [A]
time = 0.08, size = 17, normalized size = 1.00

$$-\frac{1}{\sqrt{1-x^2}\,\mathrm{ArcSin}(x)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((1 - x^2)*ArcSin[x]^2) - x/((1 - x^2)^(3/2)*ArcSin[x]),x]
```

```
[Out] -(1/(Sqrt[1 - x^2]*ArcSin[x]))
```

Maple [F]
time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{1}{(-x^2+1)\arcsin(x)^2} - \frac{x}{(-x^2+1)^{\frac{3}{2}}\arcsin(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x)
```

```
[Out] int(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 37 vs. $2(15) = 30$.
time = 0.77, size = 37, normalized size = 2.18

$$\frac{\sqrt{x+1}\,\sqrt{-x+1}}{(x^2-1)\arctan\left(x, \sqrt{x+1}\,\sqrt{-x+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="m
axima")
```

```
[Out] sqrt(x + 1)*sqrt(-x + 1)/((x^2 - 1)*arctan2(x, sqrt(x + 1)*sqrt(-x + 1)))
```

Fricas [A]
time = 2.12, size = 21, normalized size = 1.24

$$\frac{\sqrt{-x^2+1}}{(x^2-1)\arcsin(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="f
ricas")
```

```
[Out] sqrt(-x^2 + 1)/((x^2 - 1)*arcsin(x))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(x-1)(x+1)\left(x\operatorname{asin}(x) - \sqrt{1-x^2}\right)}{(-(x-1)(x+1))^{\frac{5}{2}}\operatorname{asin}^2(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x**2+1)/asin(x)**2-x/(-x**2+1)**(3/2)/asin(x),x)
```

```
[Out] Integral((x - 1)*(x + 1)*(x*asin(x) - sqrt(1 - x**2))/((-(x - 1)*(x + 1))**
(5/2)*asin(x)**2), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 70 vs. $2(15) = 30$.
time = 0.45, size = 70, normalized size = 4.12

$$\frac{1}{\frac{x^2 \arcsin(x)}{\left(\sqrt{-x^2+1}+1\right)^2} - \arcsin(x)} + \frac{x^2}{\left(\frac{x^2 \arcsin(x)}{\left(\sqrt{-x^2+1}+1\right)^2} - \arcsin(x)\right)\left(\sqrt{-x^2+1}+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="g
iac")
```

```
[Out] 1/(x^2*arcsin(x)/(sqrt(-x^2 + 1) + 1)^2 - arcsin(x)) + x^2/((x^2*arcsin(x)/
(sqrt(-x^2 + 1) + 1)^2 - arcsin(x))*(sqrt(-x^2 + 1) + 1)^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.06

$$-\int \frac{1}{\operatorname{asin}(x)^2 (x^2-1)} + \frac{x}{\operatorname{asin}(x) (1-x^2)^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(- 1/(asin(x)^2*(x^2 - 1)) - x/(asin(x)*(1 - x^2)^(3/2)),x)
```

```
[Out] -int(1/(asin(x)^2*(x^2 - 1)) + x/(asin(x)*(1 - x^2)^(3/2)), x)
```

3.380 $\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\mathrm{Int}\left(\frac{x^m\sqrt{1-c^2x^2}}{(a+b\mathrm{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
[Out] Defer[Int][(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 1.93, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((c^2*x^2 - 1)*x^m - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c)*integrate(((c^2*m + 2*c^2)*x^2 - m)*x^m/(b^2*c*x*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1)) + a*b*c)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\sqrt{-(cx-1)(cx+1)}}{(a+b\operatorname{asin}(cx))^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**m*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\sqrt{1-c^2\,x^2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
```

```
[Out] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.381 $\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\text{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=214

$$-\frac{x^3(1-c^2x^2)}{bc(a+b\text{ArcSin}(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^4}-5\text{c}$$

```
[Out] -x^3*(-c^2*x^2+1)/b/c/(a+b*arcsin(c*x))+1/8*Ci((a+b*arcsin(c*x))/b)*cos(a/b
)/b^2/c^4+3/16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4-5/16*Ci(5*(a+b*
arcsin(c*x))/b)*cos(5*a/b)/b^2/c^4+1/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2
/c^4+3/16*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^4-5/16*Si(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b^2/c^4
```

Rubi [A]
time = 0.43, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4731, 4491, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^4}-\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^4}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^4}+\frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^4}-\frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^4}-\frac{x^3(1-c^2x^2)}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(8*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*A
rcSin[c*x]))/b])/(16*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b])/(16*b^2*c^4) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(
8*b^2*c^4) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^
2*c^4) - (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^
4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rubi steps

$$\int \frac{x^3\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^3(1-c^2x^2)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(5c)\int \frac{x^4}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^3(1-c^2x^2)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{5\text{Subst}\left(\int \frac{\cos(\ldots}{\ldots}\right.}{\ldots}$$

$$= -\frac{x^3(1-c^2x^2)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{3\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)} - \frac{\cos(3x)}{4(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{5\text{Sub}\ldots}{\ldots}$$

$$= -\frac{x^3(1-c^2x^2)}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{5\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc^4} - \frac{5\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx \ldots\right.}{8bc^4}$$

$$= -\frac{x^3(1-c^2x^2)}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8bc^4} + \frac{(3\cos \ldots}{\ldots}$$

$$= -\frac{x^3(1-c^2x^2)}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(\ldots\right.}{16b^2c^4}$$

Mathematica [A]
time = 0.37, size = 175, normalized size = 0.82

$$\frac{-\frac{16bc^3x^3}{a+b\text{ArcSin}(cx)} + \frac{16bc^5x^5}{a+b\text{ArcSin}(cx)} + 2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + 3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) - 5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + 2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + 3\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) - 5\sin\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16b^2c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-16*b*c^3*x^3)/(a + b*ArcSin[c*x]) + (16*b*c^5*x^5)/(a + b*ArcSin[c*x]) +
 2*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*CosIntegral[3*(
a/b + ArcSin[c*x])] - 5*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 2
*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Sin[(3*a)/b]*SinIntegral[3*(a/
b + ArcSin[c*x])] - 5*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*
b^2*c^4)
```

Maple [A]
time = 0.11, size = 340, normalized size = 1.59

method	result
default	$-\frac{5\arcsin(cx)\,\text{sinIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)b+5\arcsin(cx)\,\text{cosineIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)b-2\arcsin(cx)\,\text{sinInteg}\ldots}{\ldots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/c^4*(5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c*x)
*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-2*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin
(a/b)*b-2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b-3*arcsin(c*x)*Si(3*arc
sin(c*x)+3*a/b)*sin(3*a/b)*b-3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/
b)*b+5*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5
*a/b)*a-2*Si(arcsin(c*x)+a/b)*sin(a/b)*a-2*Ci(arcsin(c*x)+a/b)*cos(a/b)*a-3
*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*
a+2*x*b*c-sin(5*arcsin(c*x))*b+sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^5 - x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
*integrate((5*c^2*x^4 - 3*x^2)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b
*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\sqrt{1-c^2\,x^2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
```

```
[Out] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.382 $\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\text{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=94

$$-\frac{x^2(1-c^2x^2)}{bc(a+b\text{ArcSin}(cx))}-\frac{\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c^3}$$

```
[Out] -x^2*(-c^2*x^2+1)/b/c/(a+b*arcsin(c*x))+1/2*cos(4*a/b)*Si(4*(a+b*arcsin(c*x
))/b)/b^2/c^3-1/2*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^3
```

Rubi [A]
time = 0.30, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4799, 4731, 4491, 12, 3384, 3380, 3383}

$$-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c^3}-\frac{x^2(1-c^2x^2)}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(4*(a + b*A
rcSin[c*x]))/b]*Sin[(4*a)/b])/(2*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a
 + b*ArcSin[c*x]))/b])/(2*b^2*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rubi steps

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x^2(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))}+\frac{2\int\frac{x}{a+b\sin^{-1}(cx)}\,dx}{bc}-\frac{(4c)\int\frac{x^3}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^2(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))}+\frac{2\text{Subst}\left(\int\frac{\cos(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{4\text{Subst}\left(\int\frac{\cos(x)\,\text{s}}{a+}\right.}{}$$

$$= -\frac{x^2(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))}+\frac{2\text{Subst}\left(\int\frac{\sin(2x)}{2(a+bx)}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}-\frac{4\text{Subst}\left(\int\left(\frac{\sin(2x)}{4(a+bx)}\right.\right.}{}$$

$$= -\frac{x^2(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))}+\frac{\text{Subst}\left(\int\frac{\sin(4x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2bc^3}$$

$$= -\frac{x^2(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))}+\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4a}{b}+4x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2bc^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{S}}{}$$

$$= -\frac{x^2(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))}-\frac{\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\sin^{-1}(\right.}{2b^2c^3}$$

Mathematica [A]
time = 0.23, size = 82, normalized size = 0.87

$$\frac{\frac{2bc^2x^2(-1+c^2x^2)}{a+b\text{ArcSin}(cx)}-\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{4a}{b}\right)+\cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{2b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((2*b*c^2*x^2*(-1 + c^2*x^2))/(a + b*ArcSin[c*x]) - CosIntegral[4*(a/b + Ar
cSin[c*x])]*Sin[(4*a)/b] + Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])])
/(2*b^2*c^3)
```

Maple [A]
time = 0.10, size = 136, normalized size = 1.45

method	result
default	$\frac{4\arcsin(cx)\,\text{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-4\arcsin(cx)\,\text{cosineIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b+4\,\text{sinIntegral}\left(4\arcsin(cx)\right.}{8c^3(a+b\arcsin(cx))b^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/c^3*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*C
i(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+4*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-
```

```
4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+cos(4*arcsin(c*x))*b-b)/(a+b*arcsin(
c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^4 - x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
*integrate(2*(2*c^2*x^3 - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c
)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**2*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 563 vs. 2(88) = 176.
time = 0.51, size = 563, normalized size = 5.99

$$-\frac{4b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{3}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{4b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{4}\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}-\frac{4a\cos\left(\frac{a}{b}\right)^{3}\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{4a\cos\left(\frac{a}{b}\right)^{4}\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{2b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}-\frac{4b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{2a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}-\frac{4a\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{\left(c^{2}x^{2}-1\right)^{2}b}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{b\arcsin\left(cx\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}+\frac{\left(c^{2}x^{2}-1\right)b}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{a\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4
*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 4*a*cos(a/b)^3*co
s_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + 4*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x)
 + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x)
)*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 4*b*arcsin(c*x)*cos(a/b)^2*s
in_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*a*
cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x)
+ a*b^2*c^3) - 4*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*
arcsin(c*x) + a*b^2*c^3) + (c^2*x^2 - 1)^2*b/(b^3*c^3*arcsin(c*x) + a*b^2*c
^3) + 1/2*b*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin
(c*x) + a*b^2*c^3) + (c^2*x^2 - 1)*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/
2*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\sqrt{1-c^2\,x^2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
```

```
[Out] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.383 $\int \frac{x\sqrt{1-c^2x^2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=150

$$-\frac{x(1-c^2x^2)}{bc(a+b\text{ArcSin}(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^2}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^2}+\frac{\sin\ldots}{\ldots}$$

[Out] -x*(-c^2*x^2+1)/b/c/(a+b*arcsin(c*x))+1/4*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2/c^2+3/4*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^2+1/4*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^2+3/4*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^2

Rubi [A]
time = 0.25, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.269$, Rules used = {4799, 4719, 3384, 3380, 3383, 4731, 4491}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^2}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^2}+\frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^2}-\frac{x(1-c^2x^2)}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

[In] Int[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]

[Out] -((x*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^2) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^2) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^2)

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rubi steps

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))} + \frac{\int \frac{1}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(3c)\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{b^2c^2} - \frac{3\text{Subst}\left(\int \text{co}\right.}{}$$

$$= -\frac{x(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))} - \frac{3\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)} - \frac{\cos(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^2} + \frac{\cos\left(\right.}{}$$

$$= -\frac{x(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2} - \frac{3\text{S}}{}$$

$$= -\frac{x(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2} - \frac{(3}{}$$

$$= -\frac{x(1-c^2x^2)}{bc\,(a+b\sin^{-1}(cx))} - \frac{3\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^2} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}\right.}{4b^2c^2}$$

Mathematica [A]
time = 0.21, size = 125, normalized size = 0.83

$$\frac{-\frac{4bcx}{a+b\text{ArcSin}(cx)} + \frac{4bc^3x^3}{a+b\text{ArcSin}(cx)} + \cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + 3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + \sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + 3\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{4b^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-4*b*c*x)/(a + b*ArcSin[c*x]) + (4*b*c^3*x^3)/(a + b*ArcSin[c*x]) + Cos[a
/b]*CosIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + Ar
cSin[c*x])] + Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Sin[(3*a)/b]*SinI
ntegral[3*(a/b + ArcSin[c*x])])/(4*b^2*c^2)
```

Maple [A]
time = 0.09, size = 223, normalized size = 1.49

method	result
default	$\frac{\arcsin(cx)\,\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+3\arcsin(cx)\,\text{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b+3\arcsin(cx)\,\text{cosineIntegral}(3}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/c^2*(arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+3*arcsin(c*x)*Si(3*arcs
in(c*x)+3*a/b)*sin(3*a/b)*b+3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b
```

```
)*b+arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+Ci(arcsin(c*x)+a/b)*cos(a/b)
*a+3*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a
/b)*a+Si(arcsin(c*x)+a/b)*sin(a/b)*a-x*b*c-sin(3*arcsin(c*x))*b)/(a+b*arcsi
n(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integ
rate((3*c^2*x^2 - 1)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c), x) - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{-(cx-1)(cx+1)}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 608 vs. 2(140) = 280.
time = 0.49, size = 608, normalized size = 4.05

$$\frac{3b\arcsin(cx)\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}+\frac{3b\arcsin(cx)\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}+\frac{3a\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}+\frac{3a\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}+\frac{(c^2x^2-1)bcx}{b^3c^2\arcsin(cx)+ab^2c^2}-\frac{9b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}+\frac{b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}-\frac{3b\arcsin(cx)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}+\frac{b\arcsin(cx)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}-\frac{9a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}+\frac{a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}-\frac{3a\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}+\frac{a\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\left(b^3c^2\arcsin(cx)+ab^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 3*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 3*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(3*
a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 3*a*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 3*a*co
s(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) + (c^2*x^2 - 1)*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 9/4*
b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 1/4*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*
x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 3/4*b*arcsin(c*x)*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/4*b*arcsi
n(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^
2*c^2) - 9/4*a*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) + 1/4*a*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^
2*arcsin(c*x) + a*b^2*c^2) - 3/4*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c
*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/4*a*sin(a/b)*sin_integral(a/b +
arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\sqrt{1-c^2x^2}}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
```

```
[Out] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.384 $\int \frac{\sqrt{1-c^2x^2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=86

$$-\frac{1-c^2x^2}{bc(a+b\text{ArcSin}(cx))}+\frac{\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c}$$

```
[Out] (c^2*x^2-1)/b/c/(a+b*arcsin(c*x))-cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/
c+Ci(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c
```

Rubi [A]
time = 0.11, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {4751, 4731, 4491, 12, 3384, 3380, 3383}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c}-\frac{1-c^2x^2}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b*ArcSin[
c*x]))/b]*Sin[(2*a)/b])/(b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSi
n[c*x]))/b])/(b^2*c)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{(2c)\int\frac{x}{a+b\sin^{-1}(cx)}\,dx}{b}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{2\text{Subst}\left(\int\frac{\cos(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{2\text{Subst}\left(\int\frac{\sin(2x)}{2(a+bx)}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Subst}\left(\int\frac{\sin(2x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}+\frac{\sin\left(\frac{2a}{b}\right)
\\
&= -\frac{1-c^2x^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\sin^{-1}
\end{aligned}$$

Mathematica [A]
time = 0.14, size = 72, normalized size = 0.84

$$\frac{\frac{b(-1+c^2x^2)}{a+b\text{ArcSin}(cx)} + \text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{2a}{b}\right) - \cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{b^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((b*(-1 + c^2*x^2))/(a + b*ArcSin[c*x]) + CosIntegral[2*(a/b + ArcSin[c*x])
]*Sin[(2*a)/b] - Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b^2*c)
```

Maple [A]
time = 0.10, size = 134, normalized size = 1.56

method	result
default	$-\frac{2\arcsin(cx)\,\text{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-2\arcsin(cx)\,\text{cosineIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b+2\,\text{sinIntegral}\left(2\arcsin(\right.}{2c(a+b\arcsin(cx))b^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/c*(2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-2*arcsin(c*x)*Ci
(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-2
*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(2*arcsin(c*x))*b+b)/(a+b*arcsin(c
*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 - 2*(b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)
*integrate(x/(b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b), x) - 1
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2),
x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 290 vs. 2(84) = 168.
time = 0.50, size = 290, normalized size = 3.37

$$\frac{2\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{2\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{2\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{2\,a\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{b\arcsin\left(cx\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{(c^{2}x^{2}-1)b}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{a\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*
c*arcsin(c*x) + a*b^2*c) - 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b +
2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 2*a*cos(a/b)*cos_integral(2*
a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*a*cos(a/b)^
2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + b*arc
sin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
+ (c^2*x^2 - 1)*b/(b^3*c*arcsin(c*x) + a*b^2*c) + a*sin_integral(2*a/b + 2*
arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{1-c^{2}\,x^{2}}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x))^2,x)
```

```
[Out] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x))^2, x)
```

3.385 $\int \frac{\sqrt{1-c^2x^2}}{x(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=105

$$-\frac{1-c^2x^2}{bcx(a+b\text{ArcSin}(cx))}-\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2}-\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2}-\frac{\text{Int}\left(\frac{1}{x^2(a+b\text{ArcSin}}\right.}{bc}$$

```
[Out] (c^2*x^2-1)/b/c/x/(a+b*arcsin(c*x))-Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2-Si
((a+b*arcsin(c*x))/b)*sin(a/b)/b^2-Unintegrable(1/x^2/(a+b*arcsin(c*x)),x)/
b/c
```

Rubi [A]
time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*x*(a + b*ArcSin[c*x]))) - (Cos[a/b]*CosIntegral[(a + b
*ArcSin[c*x])/b])/b^2 - (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/b^2 -
 Defer[Int][1/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{1-c^2x^2}}{x\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}-\frac{c\int \frac{1}{a+b\sin^{-1}(cx)}\,dx}{b}\\
&= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{b^2}-\frac{\int \frac{1}{x^2(a+b\sin}}{bc}\\
&= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}-\frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a\right.}{b^2}\\
&= -\frac{1-c^2x^2}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2}-\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2}-
\end{aligned}$$

Mathematica [A]
time = 7.37, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.77, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^{2} x^{2}+1}}{x \left(a +b \arcsin \left(c x \right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)*i
ntegrate((c^2*x^2 + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
) + a*b*c*x^2), x) - 1)/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
 + a*b*c*x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^
2*x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{- \left(c x - 1\right) \left(c x + 1\right)}}{x \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x*(a + b*asin(c*x))**2), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{1-c^2\,x^2}}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))^2),x)
```

```
[Out] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))^2), x)
```

3.386 $\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=57

$$-\frac{1-c^2x^2}{bcx^2(a+b\text{ArcSin}(cx))}-\frac{2\text{Int}\left(\frac{1}{x^3(a+b\text{ArcSin}(cx))},x\right)}{bc}$$

```
[Out] (c^2*x^2-1)/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable(1/x^3/(a+b*arcsin(c*x)
),x)/b/c
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][1/(x^3*(a +
b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1-c^2x^2}{bcx^2\left(a+b\sin^{-1}(cx)\right)}-\frac{2\int \frac{1}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A]
time = 1.61, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.67, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^2x^2+1}}{x^2\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 - 2*(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*
x^2)*integrate(1/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c*x^3), x) - 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a
*b*c*x^2)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x)
+ a^2*x^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x^2\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**2*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{1-c^2\,x^2}}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))^2), x)
```

3.387 $\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))^2},x\right)$$

[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Int[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2),x]

[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2), x]

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 11.28, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2), x]

Maple [A]
time = 3.36, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^2x^2+1}}{x^3\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 + (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^
3)*integrate((c^2*x^2 - 3)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)) + a*b*c*x^4), x) - 1)/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + a*b*c*x^3)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x)
+ a^2*x^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-\left(cx - 1\right)\left(cx + 1\right)}}{x^{3}\left(a + b \operatorname{asin}\left(cx\right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**3*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{1-c^2\,x^2}}{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))^2),x)
```

```
[Out] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))^2), x)
```

3.388 $\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 2.54, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 4.62, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^2x^2+1}}{x^4\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^2 + (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^
4)*integrate(2*(c^2*x^2 - 2)/(b^2*c*x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)) + a*b*c*x^5), x) - 1)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b*c*x^4)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x)
+ a^2*x^4), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x^{4}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**4/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**4*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x^4), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{1-c^2\,x^2}}{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))^2), x)
```

3.389 $\int \frac{x^m (1-c^2x^2)^{3/2}}{(a+b\mathbf{ArcSin}(cx))^2} dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2} dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\sin^{-1}(cx))^2} dx = \int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\sin^{-1}(cx))^2} dx$$

Mathematica [A]
time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\text{ArcSin}(cx))^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 2.25, size = 0, normalized size = 0.00

$$\int \frac{x^m(-c^2x^2+1)^{\frac{3}{2}}}{(a+b\arcsin(cx))^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((c^4*x^4 - 2*c^2*x^2 + 1)*x^m - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b*c)*integrate(((c^4*m + 4*c^4)*x^4 - 2*(c^2*m + 2*c^2)*x^2 +
m)*x^m/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x), x))/
(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^2 + 2*a*b*a
rcsin(c*x) + a^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**m*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\left(1-c^2\,x^2\right)}^{3/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
```

```
[Out] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.390 $\int \frac{x^3\left(1-c^2x^2\right)^{3/2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=278

$$-\frac{x^3(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}+\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64b^2c^4}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^4}-$$

```
[Out] -x^3*(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))+3/64*Ci((a+b*arcsin(c*x))/b)*cos(
a/b)/b^2/c^4+9/64*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4-5/64*Ci(5*(a
+b*arcsin(c*x))/b)*cos(5*a/b)/b^2/c^4-7/64*Ci(7*(a+b*arcsin(c*x))/b)*cos(7*
a/b)/b^2/c^4+3/64*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^4+9/64*Si(3*(a+b*a
rcsin(c*x))/b)*sin(3*a/b)/b^2/c^4-5/64*Si(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)
/b^2/c^4-7/64*Si(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b^2/c^4
```

Rubi [A]
time = 0.58, antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4809, 4491, 3384, 3380, 3383}

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64b^2c^4}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^4}-\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^4}-\frac{7\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^4}+\frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64b^2c^4}+\frac{9\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^4}-\frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^4}-\frac{7\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^4}-\frac{x^3(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[(a + b*ArcSin[c*x])/b])/(64*b^2*c^4) + (9*Cos[(3*a)/b]*CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b])/(64*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*
ArcSin[c*x]))/b])/(64*b^2*c^4) - (7*Cos[(7*a)/b]*CosIntegral[(7*(a + b*ArcS
in[c*x]))/b])/(64*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b]
)/(64*b^2*c^4) + (9*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(6
4*b^2*c^4) - (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(64*b^
2*c^4) - (7*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b^2*c^
4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x^3(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\int \frac{x^2(1-c^2x^2)}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(7c)\int \frac{x^4(1-c^2x^2)}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\text{Subst}\left(\int \frac{\cos^3(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{7\text{Subst}\left(\int \frac{\cos^3}{}\right.}{}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\text{Subst}\left(\int \left(\frac{\cos(x)}{8(a+bx)} - \frac{\cos(3x)}{16(a+bx)} - \frac{\cos(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx\right.}{bc^4}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{7\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64bc^4} - \frac{7\text{Subst}\left(\int \frac{\cos(7x)}{a+bx}\,dx\right.}{64bc}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} - \frac{\left(21\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64bc^4} + \frac{(3\cos}{}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64b^2c^4} + \frac{9\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}\right.}{64b^2c^4}$$

Mathematica [A]
time = 0.74, size = 399, normalized size = 1.44

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/64*(64*b*c^3*x^3 - 128*b*c^5*x^5 + 64*b*c^7*x^7 - 3*(a + b*ArcSin[c*x])*
Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - 9*(a + b*ArcSin[c*x])*Cos[(3*a)/b
]*CosIntegral[3*(a/b + ArcSin[c*x])] + 5*a*Cos[(5*a)/b]*CosIntegral[5*(a/b
+ ArcSin[c*x])] + 5*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[
c*x])] + 7*a*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 7*b*ArcSin[c
*x]*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] - 3*a*Sin[a/b]*SinInteg
ral[a/b + ArcSin[c*x]] - 3*b*ArcSin[c*x]*Sin[a/b]*SinIntegral[a/b + ArcSin[
c*x]] - 9*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 9*b*ArcSin[c*
x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*a*Sin[(5*a)/b]*SinIn
tegral[5*(a/b + ArcSin[c*x])] + 5*b*ArcSin[c*x]*Sin[(5*a)/b]*SinIntegral[5*
(a/b + ArcSin[c*x])] + 7*a*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])]
+ 7*b*ArcSin[c*x]*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])])/(b^2*c^4
*(a + b*ArcSin[c*x]))
```

Maple [A]
time = 0.12, size = 455, normalized size = 1.64

method	result
default	$-\frac{7\arcsin(cx)\,\text{cosineIntegral}\left(7\arcsin(cx)+\frac{7a}{b}\right)\cos\left(\frac{7a}{b}\right)b-9\arcsin(cx)\,\text{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b-9\arcsin(cx)\,\text{cosineInte}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/64/c^4*(7*arcsin(c*x)*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*b-9*arcsin(c*x)
*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b-9*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)
*cos(3*a/b)*b+5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c
*x)*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-3*arcsin(c*x)*Si(arcsin(c*x)+a/b)*
sin(a/b)*b-3*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+7*arcsin(c*x)*Si(7*
arcsin(c*x)+7*a/b)*sin(7*a/b)*b+7*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*a-9*Si
(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-9*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+5
*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*
a-3*Si(arcsin(c*x)+a/b)*sin(a/b)*a-3*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+7*Si(7*
arcsin(c*x)+7*a/b)*sin(7*a/b)*a+3*x*b*c-sin(7*arcsin(c*x))*b+3*sin(3*arcsin
(c*x))*b-sin(5*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^7 - 2*c^2*x^5 + x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)) + a*b*c)*integrate((7*c^4*x^6 - 10*c^2*x^4 + 3*x^2)/(b^2*c*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^5 - x^3)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arc
sin(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(-(cx-1)(cx+1))^{\frac{3}{2}}}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2065 vs. $2(261) = 522$.
time = 0.54, size = 2065, normalized size = 7.43

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -7*b*arcsin(c*x)*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 7*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(7
*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 7*a*cos(a/b)^7*co
s_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 7*a*c
os(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 49/4*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5/4*b*arcsin(c*x)*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 35/4*b
*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) - 5/4*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_int
egral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 49/4*a*cos
(a/b)^5*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^
4) - 5/4*a*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c
*x) + a*b^2*c^4) + 35/4*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5/4*a*cos(a/b)^4*sin(a/b)*sin_in
tegral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - (c^2*x^2
- 1)^3*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 49/8*b*arcsin(c*x)*cos(a/b
)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) +
 25/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
4*arcsin(c*x) + a*b^2*c^4) + 9/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a
/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/8*b*arcsin(c*x)*
cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x
) + a*b^2*c^4) + 15/16*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b
 + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 9/16*b*arcsin(c*x)*co
s(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
```

```
+ a*b^2*c^4) - (c^2*x^2 - 1)^2*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 49
/8*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
a*b^2*c^4) + 25/16*a*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
4*arcsin(c*x) + a*b^2*c^4) + 9/16*a*cos(a/b)^3*cos_integral(3*a/b + 3*arcsi
n(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/8*a*cos(a/b)^2*sin(a/b)*sin_
integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 15/16*a
*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*
x) + a*b^2*c^4) + 9/16*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(
c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 49/64*b*arcsin(c*x)*cos(a/b)*cos_
integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 25/64*b
*arcsin(c*x)*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c
*x) + a*b^2*c^4) - 27/64*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcs
in(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*b*arcsin(c*x)*cos(a/b)*co
s_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 7/64*b*ar
csin(c*x)*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) - 5/64*b*arcsin(c*x)*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c
*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/64*b*arcsin(c*x)*sin(a/b)*sin_in
tegral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*b*ar
csin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a
*b^2*c^4) + 49/64*a*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*a
rcsin(c*x) + a*b^2*c^4) - 25/64*a*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*
x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 27/64*a*cos(a/b)*cos_integral(3*a/b
 + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*a*cos(a/b)*cos_i
ntegral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 7/64*a*sin(a
/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) -
 5/64*a*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
 a*b^2*c^4) - 9/64*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*
arcsin(c*x) + a*b^2*c^4) + 3/64*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/
(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(1-c^2\,x^2\right)}^{3/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.391 $\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=220

$$-\frac{x^2(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}+\frac{\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3}-\frac{\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{4b^2c^3}-3$$

```
[Out] -x^2*(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))-1/16*cos(2*a/b)*Si(2*(a+b*arcsin(
c*x))/b)/b^2/c^3+1/4*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c^3+3/16*cos(
6*a/b)*Si(6*(a+b*arcsin(c*x))/b)/b^2/c^3+1/16*Ci(2*(a+b*arcsin(c*x))/b)*sin
(2*a/b)/b^2/c^3-1/4*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^3-3/16*Ci(6*
(a+b*arcsin(c*x))/b)*sin(6*a/b)/b^2/c^3
```

Rubi [A]

time = 0.38, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4809, 4491, 3384, 3380, 3383}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^3}-\frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^3}+\frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}-\frac{x^2(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b
*ArcSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*(a + b*ArcSi
n[c*x]))/b]*Sin[(4*a)/b])/(4*b^2*c^3) - (3*CosIntegral[(6*(a + b*ArcSin[c*x
]))/b]*Sin[(6*a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*Arc
Sin[c*x]))/b])/(16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*
x]))/b])/(4*b^2*c^3) + (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/
b])/(16*b^2*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x^2(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{2\int \frac{x(1-c^2x^2)}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(6c)\int \frac{x^3(1-c^2x^2)}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{2\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \frac{6\text{Subst}\left(\int \frac{\cos^3}{}\right.}{}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{2\text{Subst}\left(\int \left(\frac{\sin(2x)}{4(a+bx)} + \frac{\sin(4x)}{8(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \frac{6\text{Sub}}{}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\text{Subst}\left(\int \frac{\sin(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc^3} + \frac{\text{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx,\right.}{4bc^3}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2bc^3} - \frac{\left(9\cos\left(\frac{2}{}\right.\right.}{}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3} - \frac{\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin}{4b^2c^3}$$

Mathematica [A]
time = 0.54, size = 306, normalized size = 1.39

$$-\frac{16bc^2x^2-32bc^4x^4+16bc^6x^6-(a+b\text{ArcSin}(cx))\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+4(a+b\text{ArcSin}(cx))\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{4a}{b}\right)+3a\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{6a}{b}\right)+3b\text{ArcSin}(cx)\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{6a}{b}\right)+a\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+b\text{ArcSin}(cx)\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-4a\cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-4b\text{ArcSin}(cx)\cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-3a\cos\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-3b\text{ArcSin}(cx)\cos\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16b^2c^3(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/16*(16*b*c^2*x^2 - 32*b*c^4*x^4 + 16*b*c^6*x^6 - (a + b*ArcSin[c*x])*Cos
Integral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] + 4*(a + b*ArcSin[c*x])*CosInt
egral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 3*a*CosIntegral[6*(a/b + ArcSin
[c*x])]*Sin[(6*a)/b] + 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcSin[c*x])]*S
in[(6*a)/b] + a*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + b*ArcSin[
c*x]*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - 4*a*Cos[(4*a)/b]*Sin
Integral[4*(a/b + ArcSin[c*x])] - 4*b*ArcSin[c*x]*Cos[(4*a)/b]*SinIntegral[
4*(a/b + ArcSin[c*x])] - 3*a*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])
] - 3*b*ArcSin[c*x]*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(b^2*c
^3*(a + b*ArcSin[c*x]))
```

Maple [A]
time = 0.09, size = 364, normalized size = 1.65

method	result

default	$\frac{8 \arcsin(cx) \operatorname{sinIntegral}\left(4 \arcsin(cx)+\frac{4a}{b}\right) \cos\left(\frac{4a}{b}\right) b-8 \arcsin(cx) \operatorname{cosineIntegral}\left(4 \arcsin(cx)+\frac{4a}{b}\right) \sin\left(\frac{4a}{b}\right) b-2 \arcsin(cx) \operatorname{sinIntegral}(2}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/c^3*(8*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-8*arcsin(c*x)*
Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b-2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*
cos(2*a/b)*b+2*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+6*arcsin(c*
x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-6*arcsin(c*x)*Ci(6*arcsin(c*x)+6*a/
b)*sin(6*a/b)*b+8*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-8*Ci(4*arcsin(c*x)+4
*a/b)*sin(4*a/b)*a-2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a+2*Ci(2*arcsin(c*x
)+2*a/b)*sin(2*a/b)*a+6*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*a-6*Ci(6*arcsin(
c*x)+6*a/b)*sin(6*a/b)*a+2*cos(4*arcsin(c*x))*b-cos(2*arcsin(c*x))*b+cos(6*
arcsin(c*x))*b-2*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^6 - 2*c^2*x^4 + x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)) + a*b*c)*integrate(2*(3*c^4*x^5 - 4*c^2*x^3 + x)/(b^2*c*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^4 - x^2)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arc
sin(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**2*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)

[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 1553 vs. $2(207) = 414$.
time = 0.54, size = 1553, normalized size = 7.06

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] -6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 6*a*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9*b*arcsin(c*x)*cos(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9*a*cos(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/8*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 27/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - (c^2*x^2 - 1)^3*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/8*a*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 27/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*a*cos(a/b)^2*

```
sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - (c^
2*x^2 - 1)^2*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3/16*b*arcsin(c*x)*sin_i
ntegral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*ar
csin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*
c^3) + 1/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcs
in(c*x) + a*b^2*c^3) - 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*
arcsin(c*x) + a*b^2*c^3) + 1/4*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(2*a/b + 2*arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(1-c^2\,x^2\right)}^{3/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.392 $\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\textbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=214

$$-\frac{x(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^2}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^2}+\frac{5\,c}{}$$

```
[Out] -x*(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))+1/8*Ci((a+b*arcsin(c*x))/b)*cos(a/b
)/b^2/c^2+9/16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^2+5/16*Ci(5*(a+b*
arcsin(c*x))/b)*cos(5*a/b)/b^2/c^2+1/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2
/c^2+9/16*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^2+5/16*Si(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b^2/c^2
```

Rubi [A]
time = 0.41, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {4799, 4753, 3393, 3384, 3380, 3383, 4809, 4491}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^2}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^2}+\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^2}+\frac{9\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^2}+\frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^2}-\frac{x(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(8*b^2*c^2) + (9*Cos[(3*a)/b]*CosIntegral[(3*(a + b*A
rcSin[c*x]))/b])/(16*b^2*c^2) + (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b])/(16*b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(
8*b^2*c^2) + (9*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^
2*c^2) + (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^
2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{\int \frac{1-c^2x^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(5c)\int \frac{x^2(1-c^2x^2)}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \frac{\cos^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{5\text{Subst}\left(\int \frac{\cos^3(x)\sin^2(}{a+bx}\right.}{bc}$$

$$= -\frac{x(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \left(\frac{3\cos(x)}{4(a+bx)} + \frac{\cos(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^2} - 5\text{Subs}$$

$$= -\frac{x(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4bc^2} + \frac{5\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx,\right.}{16bc^2}$$

$$= -\frac{x(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} - \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{8bc^2} + \frac{(3\cos}{}$$

$$= -\frac{x(1-c^2x^2)^2}{bc\,(a+b\sin^{-1}(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^2} + \frac{9\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(\right.}{16b^2c^2}$$

Mathematica [A]
time = 0.38, size = 295, normalized size = 1.38

$$\frac{-16bcx+32bc^3x^3-16bc^5x^5+2(a+b\text{ArcSin}(cx))\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+9(a+b\text{ArcSin}(cx))\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+5a\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+5b\text{ArcSin}(cx)\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+2a\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+2b\text{ArcSin}(cx)\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+9a\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+9b\text{ArcSin}(cx)\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+5a\sin\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+5b\text{ArcSin}(cx)\sin\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16b^2c^2(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-16*b*c*x + 32*b*c^3*x^3 - 16*b*c^5*x^5 + 2*(a + b*ArcSin[c*x])*Cos[a/b]*C
osIntegral[a/b + ArcSin[c*x]] + 9*(a + b*ArcSin[c*x])*Cos[(3*a)/b]*CosInteg
ral[3*(a/b + ArcSin[c*x])] + 5*a*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c
*x])] + 5*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 2
*a*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 2*b*ArcSin[c*x]*Sin[a/b]*SinIn
tegral[a/b + ArcSin[c*x]] + 9*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*
x])] + 9*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*
a*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + 5*b*ArcSin[c*x]*Sin[(5*
a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b^2*c^2*(a + b*ArcSin[c*x]))
```

Maple [A]
time = 0.10, size = 341, normalized size = 1.59

method	result
default	$\frac{5\arcsin(cx)\,\text{sinIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)b+5\arcsin(cx)\,\text{cosineIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)b+9\arcsin(cx)\,\text{sinIntegral}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/c^2*(5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c*x)*
Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b+9*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*
sin(3*a/b)*b+9*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+2*arcsin(c*
x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b
)*b+5*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5*
a/b)*a+9*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+9*Ci(3*arcsin(c*x)+3*a/b)*cos
(3*a/b)*a+2*Si(arcsin(c*x)+a/b)*sin(a/b)*a+2*Ci(arcsin(c*x)+a/b)*cos(a/b)*a
-2*x*b*c-sin(5*arcsin(c*x))*b-3*sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^5 - 2*c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 a*b*c)*integrate((5*c^4*x^4 - 6*c^2*x^2 + 1)/(b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c), x) + x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^3 - x)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsi
n(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(-(cx-1)(cx+1))^{\frac{3}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1215 vs. $2(201) = 402$.
time = 0.54, size = 1215, normalized size = 5.68

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 5*b*arcsin(c*x)*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 5*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(5*
a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5*a*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5*a*co
s(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) - 25/4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(
c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 9/4*b*arcsin(c*x)*cos(a/b)^3*cos_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 15/4*b*
arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
2*arcsin(c*x) + a*b^2*c^2) + 9/4*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - (c^2*x^2 -
1)^2*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 25/4*a*cos(a/b)^3*cos_integr
al(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 9/4*a*cos(a/b
)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) -
 15/4*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*ar
csin(c*x) + a*b^2*c^2) + 9/4*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*a
rcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/16*b*arcsin(c*x)*cos(a/b
)*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 2
7/16*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*ar
csin(c*x) + a*b^2*c^2) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/16*b*arcsin(c*x)*sin(a/b)*si
n_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 9/16*
b*arcsin(c*x)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 1/8*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*
x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/16*a*cos(a/b)*cos_integral(5*a/b
 + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/16*a*cos(a/b)*cos_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/8*a*c
os(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) +
 5/16*a*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) +
 a*b^2*c^2) - 9/16*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*
arcsin(c*x) + a*b^2*c^2) + 1/8*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(
b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,\left(1-c^2\,x^2\right)^{3/2}}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
[Out] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.393 $\int \frac{(1-c^2x^2)^{3/2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=150

$$-\frac{(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}+\frac{\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c}+\frac{\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c}-\text{c}$$

```
[Out] -(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))-cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/
b^2/c-1/2*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c+Ci(2*(a+b*arcsin(c*x))
/b)*sin(2*a/b)/b^2/c+1/2*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c
```

Rubi [A]
time = 0.18, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4751, 4809, 4491, 3384, 3380, 3383}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c}+\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c}-\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c}-\frac{(1-c^2x^2)^2}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b*ArcSi
n[c*x]))/b]*Sin[(2*a)/b])/(b^2*c) + (CosIntegral[(4*(a + b*ArcSin[c*x]))/b]
*Sin[(4*a)/b])/(2*b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x])
)/b])/(b^2*c) - (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(2*b^
2*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(1-c^2x^2\right)^{3/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{(4c)\int\frac{x\left(1-c^2x^2\right)}{a+b\sin^{-1}(cx)}\,dx}{b}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{4\text{Subst}\left(\int\frac{\cos^3(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{4\text{Subst}\left(\int\left(\frac{\sin(2x)}{4(a+bx)}+\frac{\sin(4x)}{8(a+bx)}\right)\,dx,x,\sin^{-1}(cx)\right)}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Subst}\left(\int\frac{\sin(4x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{2bc}-\frac{\text{Subst}\left(\int\frac{\sin(2x)}{a+bx}\,dx,x,\right.}{bc}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}-\frac{\cos\left(\frac{4a}{b}\right)\text{S}}{}\\
&= -\frac{\left(1-c^2x^2\right)^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c}+\frac{\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin}{2b^2c}
\end{aligned}$$

Mathematica [A]

time = 0.41, size = 122, normalized size = 0.81

$$\frac{-\frac{2b(-1+c^2x^2)^2}{a+b\text{ArcSin}(cx)} + 2\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{2a}{b}\right) + \text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{4a}{b}\right) - 2\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) - \cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{2b^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-2*b*(-1 + c^2*x^2)^2)/(a + b*ArcSin[c*x]) + 2*CosIntegral[2*(a/b + ArcSi
n[c*x])]*Sin[(2*a)/b] + CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 2
*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral
[4*(a/b + ArcSin[c*x])])/(2*b^2*c)
```

Maple [A]
time = 0.10, size = 250, normalized size = 1.67

method	result
default	$-\frac{4\arcsin(cx)\,\text{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-4\arcsin(cx)\,\text{cosineIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b+8\arcsin(cx)\,\text{sinInteg}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*Ci
(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+8*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*co
s(2*a/b)*b-8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+4*Si(4*arcsin
(c*x)+4*a/b)*cos(4*a/b)*a-4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+8*Si(2*arc
sin(c*x)+2*a/b)*cos(2*a/b)*a-8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(4*a
rcsin(c*x))*b+4*cos(2*arcsin(c*x))*b+3*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 a*b*c)*integrate(4*(c^3*x^3 - c*x)/(b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b), x) + 1)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
+ a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 747 vs. 2(145) = 290.
time = 0.53, size = 747, normalized size = 4.98

$$\frac{4\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{3}\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{4\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{4}\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{4\,a\cos\left(\frac{a}{b}\right)^{3}\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{4\,a\cos\left(\frac{a}{b}\right)^{4}\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{2\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{2\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{4\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{2\,b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{2\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{2\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}+\frac{4\,a\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{2\,a\cos\left(\frac{a}{b}\right)^{2}\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{{\left(c^{2}x^{2}-1\right)}^{2}b}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{b\arcsin\left(cx\right)\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{2\,{\left(b^{3}c\arcsin\left(cx\right)+ab^{2}c\right)}}+\frac{b\arcsin\left(cx\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}-\frac{a\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{2\,{\left(b^{3}c\arcsin\left(cx\right)+ab^{2}c\right)}}+\frac{a\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{b^{3}c\arcsin\left(cx\right)+ab^{2}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^
3*c*arcsin(c*x) + a*b^2*c) - 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b
+ 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*a*cos(a/b)^3*cos_integra
l(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 4*a*cos(a
/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2
*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c
*arcsin(c*x) + a*b^2*c) + 2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*a
rcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*b*arcsin(c*x)*cos(a/
b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*
b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(
c*x) + a*b^2*c) - 2*a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)
/(b^3*c*arcsin(c*x) + a*b^2*c) + 2*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin
(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*a*cos(a/b)^2*sin_integral
(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*a*cos(a/b)^2*sin_
integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - (c^2*x^2 -
1)^2*b/(b^3*c*arcsin(c*x) + a*b^2*c) - 1/2*b*arcsin(c*x)*sin_integral(4*a/b
 + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + b*arcsin(c*x)*sin_integra
l(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 1/2*a*sin_integral
(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + a*sin_integral(2*a/
b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(1-c^2\,x^2\right)^{3/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x))^2,x)
[Out] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x))^2, x)
```

3.394 $\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=177

$$-\frac{(1-c^2x^2)^2}{bcx(a+b\text{ArcSin}(cx))}-\frac{9\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2}-\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2}-$$

```
[Out] -(-c^2*x^2+1)^2/b/c/x/(a+b*arcsin(c*x))-9/4*Ci((a+b*arcsin(c*x))/b)*cos(a/b
)/b^2-3/4*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2-9/4*Si((a+b*arcsin(c*x))
/b)*sin(a/b)/b^2-3/4*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2-Unintegrable(
(-c^2*x^2+1)/x^2/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [A]
time = 0.27, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x*(a + b*ArcSin[c*x]))) - (9*Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(4*b^2) - (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSi
n[c*x]))/b])/(4*b^2) - (9*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b
^2) - (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2) - Def
er[Int][(1 - c^2*x^2)/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\sin^{-1}(cx))^2}\,dx = -\frac{(1-c^2x^2)^2}{bcx(a+b\sin^{-1}(cx))} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\sin^{-1}(cx))}\,dx}{bc} - \frac{(3c)\int \frac{1-c^2x^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\sin^{-1}(cx))} - \frac{3\text{Subst}\left(\int \frac{\cos^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\sin^{-1}(cx))}}{bc}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\sin^{-1}(cx))} - \frac{3\text{Subst}\left(\int \left(\frac{3\cos(x)}{4(a+bx)} + \frac{\cos(3x)}{4(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right)}{b} - \int$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\sin^{-1}(cx))} - \frac{3\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{4b} - \frac{9\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\right.}{}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\sin^{-1}(cx))} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\sin^{-1}(cx))}\,dx}{bc} - \frac{\left(9\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\right.}{4b}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\sin^{-1}(cx))} - \frac{9\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2} - \frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin\right.}{4b^2}$$

Mathematica [A]
time = 7.33, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.77, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
 + a*b*c*x)*integrate((3*c^4*x^4 - 2*c^2*x^2 - 1)/(b^2*c*x^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) + 1)/(b^2*c*x*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
a^2*x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))^2), x)
```

3.395 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\textbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=102

$$-\frac{(1-c^2x^2)^2}{bcx^2(a+b\text{ArcSin}(cx))}-\frac{2\text{Int}\left(\frac{1-c^2x^2}{x^3(a+b\text{ArcSin}(cx))},x\right)}{bc}-\frac{2c\text{Int}\left(\frac{1-c^2x^2}{x(a+b\text{ArcSin}(cx))},x\right)}{b}$$

```
[Out] -(-c^2*x^2+1)^2/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable((-c^2*x^2+1)/x^3/(
a+b*arcsin(c*x)),x)/b/c-2*c*Unintegrable((-c^2*x^2+1)/x/(a+b*arcsin(c*x)),x
)/b
```

Rubi [A]
time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][(1 - c^2*x
^2)/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (2*c*Defer[Int][(1 - c^2*x^2)/(x
*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{(1-c^2x^2)^2}{bcx^2\left(a+b\sin^{-1}(cx)\right)}-\frac{2\int \frac{1-c^2x^2}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}-\frac{(2c)\int \frac{1-c^2x^2}{x\left(a+b\sin^{-1}(cx)\right)}\,dx}{b}$$

Mathematica [A]
time = 3.04, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{\left(-c^{2} x^{2}+1\right)^{\frac{3}{2}}}{x^{2} \left(a +b \arcsin \left(c x \right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^2)*integrate(2*(c^4*x^4 - 1)/(b^2*c*x^3*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c*x^3), x) + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x
) + a^2*x^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(- \left(c x - 1\right) \left(c x + 1\right)\right)^{\frac{3}{2}}}{x^{2} \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**2*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(1-c^2\,x^2\right)^{3/2}}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))^2), x)
```

3.396 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 11.25, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 1.88, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^3\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^3)*integrate((c^4*x^4 + 2*c^2*x^2 - 3)/(b^2*c*x^4*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4), x) + 1)/(b^2*c*x^3*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x
) + a^2*x^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}{x^{3}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**3*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(1-c^2\,x^2\right)^{3/2}}{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))^2),x)
```

```
[Out] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))^2), x)
```

3.397 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=69

$$-\frac{(1-c^2x^2)^2}{bcx^4(a+b\text{ArcSin}(cx))}-\frac{4\text{Int}\left(\frac{1-c^2x^2}{x^5(a+b\text{ArcSin}(cx))},x\right)}{bc}$$

```
[Out] -(-c^2*x^2+1)^2/b/c/x^4/(a+b*arcsin(c*x))-4*Unintegrable((-c^2*x^2+1)/x^5/(
a+b*arcsin(c*x)),x)/b/c
```

Rubi [A]
time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^4*(a + b*ArcSin[c*x]))) - (4*Defer[Int][(1 - c^2*x
^2)/(x^5*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{(1-c^2x^2)^2}{bcx^4\left(a+b\sin^{-1}(cx)\right)}-\frac{4\int \frac{1-c^2x^2}{x^5\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A]
time = 1.89, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 4.15, size = 0, normalized size = 0.00

$$\int \frac{\left(-c^{2} x^{2}+1\right)^{\frac{3}{2}}}{x^{4} \left(a +b \arcsin \left(c x \right)\right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^4)*integrate(4*(c^2*x^2 - 1)/(b^2*c*x^5*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c*x^5), x) + 1)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x^4)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x
) + a^2*x^4), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(- \left(c x - 1\right) \left(c x + 1\right)\right)^{\frac{3}{2}}}{x^{4} \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**4/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**4*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x^4), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(1-c^2\,x^2\right)^{3/2}}{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))^2), x)
```

3.398 $\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{x^m(1-c^2x^2)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 2.47, size = 0, normalized size = 0.00

$$\int \frac{x^m(-c^2x^2+1)^{\frac{5}{2}}}{(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)*x^m - (b^2*c*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(((c^6*m + 6*c^6)*x^6 - 3*(c^4*m + 4*
c^4)*x^4 + 3*(c^2*m + 2*c^2)*x^2 - m)*x^m/(b^2*c*x*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + a*b*c*x), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^
2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\left(1-c^2\,x^2\right)}^{5/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
```

```
[Out] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.399 $\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\textbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=278

$$-\frac{x^3(1-c^2x^2)^3}{bc(a+b\text{ArcSin}(cx))}+\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{128b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{32b^2c^4}-21$$

```
[Out] -x^3*(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))+3/128*Ci((a+b*arcsin(c*x))/b)*cos
(a/b)/b^2/c^4+3/32*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4-21/256*Ci(7
*(a+b*arcsin(c*x))/b)*cos(7*a/b)/b^2/c^4-9/256*Ci(9*(a+b*arcsin(c*x))/b)*co
s(9*a/b)/b^2/c^4+3/128*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^4+3/32*Si(3*(
a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^4-21/256*Si(7*(a+b*arcsin(c*x))/b)*sin
(7*a/b)/b^2/c^4-9/256*Si(9*(a+b*arcsin(c*x))/b)*sin(9*a/b)/b^2/c^4
```

Rubi [A]
time = 0.74, antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4809, 4491, 3384, 3380, 3383}

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{128b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{32b^2c^4}-\frac{21\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{256b^2c^4}-\frac{9\cos\left(\frac{9a}{b}\right)\text{CosIntegral}\left(\frac{9(a+b\text{ArcSin}(cx))}{b}\right)}{256b^2c^4}+\frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{128b^2c^4}+\frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{32b^2c^4}-\frac{21\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{256b^2c^4}-\frac{9\sin\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\text{ArcSin}(cx))}{b}\right)}{256b^2c^4}-\frac{x^3(1-c^2x^2)^3}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[(a + b*ArcSin[c*x])/b])/(128*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a
 + b*ArcSin[c*x]))/b])/(32*b^2*c^4) - (21*Cos[(7*a)/b]*CosIntegral[(7*(a +
b*ArcSin[c*x]))/b])/(256*b^2*c^4) - (9*Cos[(9*a)/b]*CosIntegral[(9*(a + b*A
rcSin[c*x]))/b])/(256*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x]
)/b])/(128*b^2*c^4) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(32*b^2*c^4) - (21*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/
(256*b^2*c^4) - (9*Sin[(9*a)/b]*SinIntegral[(9*(a + b*ArcSin[c*x]))/b])/(25
6*b^2*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x^3(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\int \frac{x^2(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(9c)\int \frac{x^4(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\text{Subst}\left(\int \frac{\cos^5(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{9\text{Subst}\left(\int \frac{\cos^5(\ldots}{\ldots}\right.}{\ldots}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\text{Subst}\left(\int \left(\frac{5\cos(x)}{64(a+bx)} - \frac{\cos(3x)}{64(a+bx)} - \frac{3\cos(5x)}{64(a+bx)} - \frac{\cos(7x)}{64(a+bx)}\right)dx, x \ldots\right.}{bc^4}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} - \frac{9\text{Subst}\left(\int \frac{\cos(7x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{256bc^4} - \frac{9\text{Subst}\left(\int \frac{\cos(9x)}{a+bx}\,dx, \ldots\right.}{256bc^4}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} - \frac{\left(27\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{128bc^4} + \frac{(15\cos \ldots}{\ldots}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{3\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{128b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(\ldots\right.}{32b^2c^4}$$

Mathematica [A]
time = 1.07, size = 408, normalized size = 1.47

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/256*(256*b*c^3*x^3 - 768*b*c^5*x^5 + 768*b*c^7*x^7 - 256*b*c^9*x^9 - 6*(
a + b*ArcSin[c*x])*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - 24*(a + b*ArcS
in[c*x])*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + 21*a*Cos[(7*a)/b
]*CosIntegral[7*(a/b + ArcSin[c*x])] + 21*b*ArcSin[c*x]*Cos[(7*a)/b]*CosInt
egral[7*(a/b + ArcSin[c*x])] + 9*a*Cos[(9*a)/b]*CosIntegral[9*(a/b + ArcSin
[c*x])] + 9*b*ArcSin[c*x]*Cos[(9*a)/b]*CosIntegral[9*(a/b + ArcSin[c*x])] -
 6*a*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - 6*b*ArcSin[c*x]*Sin[a/b]*Sin
Integral[a/b + ArcSin[c*x]] - 24*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin
[c*x])] - 24*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]
+ 21*a*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] + 21*b*ArcSin[c*x]*S
in[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] + 9*a*Sin[(9*a)/b]*SinIntegr
al[9*(a/b + ArcSin[c*x])] + 9*b*ArcSin[c*x]*Sin[(9*a)/b]*SinIntegral[9*(a/b
 + ArcSin[c*x])])/(b^2*c^4*(a + b*ArcSin[c*x]))
```

Maple [A]
time = 0.13, size = 454, normalized size = 1.63

method	result
default	$\frac{6\arcsin(cx)\,\mathrm{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+6\arcsin(cx)\,\mathrm{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b-9\arcsin(cx)\,\mathrm{sinIntegral}(9\arcsi}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/256/c^4*(6*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+6*arcsin(c*x)*Ci(ar
csin(c*x)+a/b)*cos(a/b)*b-9*arcsin(c*x)*Si(9*arcsin(c*x)+9*a/b)*sin(9*a/b)*
b-9*arcsin(c*x)*Ci(9*arcsin(c*x)+9*a/b)*cos(9*a/b)*b+24*arcsin(c*x)*Si(3*ar
csin(c*x)+3*a/b)*sin(3*a/b)*b+24*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*
a/b)*b-21*arcsin(c*x)*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*b-21*arcsin(c*x)*C
i(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*b+6*Si(arcsin(c*x)+a/b)*sin(a/b)*a+6*Ci(a
rcsin(c*x)+a/b)*cos(a/b)*a-9*Si(9*arcsin(c*x)+9*a/b)*sin(9*a/b)*a-9*Ci(9*ar
csin(c*x)+9*a/b)*cos(9*a/b)*a+24*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+24*Ci
(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a-21*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*a-
21*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*a-6*x*b*c+sin(9*arcsin(c*x))*b-8*sin(
3*arcsin(c*x))*b+3*sin(7*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^9 - 3*c^4*x^7 + 3*c^2*x^5 - x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + a*b*c)*integrate(3*(3*c^6*x^8 - 7*c^4*x^6 + 5*c^2*x^4 - x
^2)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^7 - 2*c^2*x^5 + x^3)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2
+ 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(-(cx-1)(cx+1))^{\frac{5}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2479 vs. 2(260) = 520.
time = 0.54, size = 2479, normalized size = 8.92

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -9*b*arcsin(c*x)*cos(a/b)^9*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 9*b*arcsin(c*x)*cos(a/b)^8*sin(a/b)*sin_integral(9
*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9*a*cos(a/b)^9*co
s_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9*a*c
os(a/b)^8*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 81/4*b*arcsin(c*x)*cos(a/b)^7*cos_integral(9*a/b + 9*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*b*arcsin(c*x)*cos(a/b)^7*co
s_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 63/4*
b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*
c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_i
ntegral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 81/4*a*c
os(a/b)^7*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*
c^4) - 21/4*a*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 63/4*a*cos(a/b)^6*sin(a/b)*sin_integral(9*a/b + 9*arc
sin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*a*cos(a/b)^6*sin(a/b)*si
n_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 243/1
6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arc
sin(c*x) + a*b^2*c^4) + 147/16*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b
+ 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 135/16*b*arcsin(c*x)*c
os(a/b)^4*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 105/16*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b
 + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 - 1)^4*b*c*x
/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 243/16*a*cos(a/b)^5*cos_integral(9*a/b
 + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147/16*a*cos(a/b)^5*c
os_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 135/
```

```
16*a*cos(a/b)^4*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 105/16*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*a
rcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 - 1)^3*b*c*x/(b^3*
c^4*arcsin(c*x) + a*b^2*c^4) + 135/32*b*arcsin(c*x)*cos(a/b)^3*cos_integral
(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 147/32*b*arcsin
(c*x)*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
 a*b^2*c^4) + 3/8*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*
x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 45/32*b*arcsin(c*x)*cos(a/b)^2*sin(
a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
- 63/32*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x
))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/8*b*arcsin(c*x)*cos(a/b)^2*sin(a/b
)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 1
35/32*a*cos(a/b)^3*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) - 147/32*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^
3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/8*a*cos(a/b)^3*cos_integral(3*a/b + 3*ar
csin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 45/32*a*cos(a/b)^2*sin(a/b)*
sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 63/
32*a*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 3/8*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcs
in(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 81/256*b*arcsin(c*x)*cos(a/b)*
cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147
/256*b*arcsin(c*x)*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 9/32*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3
*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*b*arcsin(c*x)*cos(a
/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/2
56*b*arcsin(c*x)*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcs
in(c*x) + a*b^2*c^4) + 21/256*b*arcsin(c*x)*sin(a/b)*sin_integral(7*a/b + 7
*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 3/32*b*arcsin(c*x)*sin(a/
b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) +
3/128*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) - 81/256*a*cos(a/b)*cos_integral(9*a/b + 9*arcsin(c*x))
/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147/256*a*cos(a/b)*cos_integral(7*a/b
+ 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/32*a*cos(a/b)*cos_in
tegral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*a*c
os(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) -
 9/256*a*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
+ a*b^2*c^4) + 21/256*a*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) - 3/32*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*a*sin(a/b)*sin_integral(a/
b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3 \left(1 - c^2 x^2\right)^{5/2}}{\left(a + b \operatorname{asin}\left(c x\right)\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.400 $\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=282

$$-\frac{x^2(1-c^2x^2)^3}{bc(a+b\text{ArcSin}(cx))}+\frac{\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3}-\frac{\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{8b^2c^3}-3$$

```
[Out] -x^2*(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))-1/16*cos(2*a/b)*Si(2*(a+b*arcsin(
c*x))/b)/b^2/c^3+1/8*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c^3+3/16*cos(
6*a/b)*Si(6*(a+b*arcsin(c*x))/b)/b^2/c^3+1/16*cos(8*a/b)*Si(8*(a+b*arcsin(c
*x))/b)/b^2/c^3+1/16*Ci(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c^3-1/8*Ci(4*
(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^3-3/16*Ci(6*(a+b*arcsin(c*x))/b)*sin(
6*a/b)/b^2/c^3-1/16*Ci(8*(a+b*arcsin(c*x))/b)*sin(8*a/b)/b^2/c^3
```

Rubi [A]
time = 0.55, antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4809, 4491, 3384, 3380, 3383}

$$\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}-\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8b^2c^3}-\frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}-\frac{\sin\left(\frac{8a}{b}\right)\text{CosIntegral}\left(\frac{8(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}-\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{8b^2c^3}+\frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}+\frac{\cos\left(\frac{8a}{b}\right)\text{Si}\left(\frac{8(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^3}-\frac{x^2(1-c^2x^2)^3}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b
*ArcSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*(a + b*ArcSi
n[c*x]))/b]*Sin[(4*a)/b])/(8*b^2*c^3) - (3*CosIntegral[(6*(a + b*ArcSin[c*x
]))/b]*Sin[(6*a)/b])/(16*b^2*c^3) - (CosIntegral[(8*(a + b*ArcSin[c*x]))/b]
*Sin[(8*a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*
x]))/b])/(16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b
])/(8*b^2*c^3) + (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(1
6*b^2*c^3) + (Cos[(8*a)/b]*SinIntegral[(8*(a + b*ArcSin[c*x]))/b])/(16*b^2*
c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x^2(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{2\int \frac{x(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(8c)\int \frac{x^3(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{2\text{Subst}\left(\int \frac{\cos^5(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \frac{8\text{Subst}\left(\int \frac{\cos^5}{}\right.}{}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{2\text{Subst}\left(\int \left(\frac{5\sin(2x)}{32(a+bx)} + \frac{\sin(4x)}{8(a+bx)} + \frac{\sin(6x)}{32(a+bx)}\right)dx, x, \sin^{-1}(cx\right.}{bc^3}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \frac{\sin(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc^3} + \frac{\text{Subst}\left(\int \frac{\sin(8x)}{a+bx}\,dx, x\right.}{16bc^3}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{\left(5\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc^3} - \frac{(3\cos}{}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3} - \frac{\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\sin}{8b^2c^3}$$

Mathematica [A]
time = 0.73, size = 414, normalized size = 1.47

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-16*b*c^2*x^2 + 48*b*c^4*x^4 - 48*b*c^6*x^6 + 16*b*c^8*x^8 + (a + b*ArcSin
[c*x])*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] - 2*(a + b*ArcSin[c*
x])*CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 3*a*CosIntegral[6*(a/
b + ArcSin[c*x])]*Sin[(6*a)/b] - 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcSi
n[c*x])]*Sin[(6*a)/b] - a*CosIntegral[8*(a/b + ArcSin[c*x])]*Sin[(8*a)/b] -
 b*ArcSin[c*x]*CosIntegral[8*(a/b + ArcSin[c*x])]*Sin[(8*a)/b] - a*Cos[(2*a
)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - b*ArcSin[c*x]*Cos[(2*a)/b]*SinInt
egral[2*(a/b + ArcSin[c*x])] + 2*a*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin
[c*x])] + 2*b*ArcSin[c*x]*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] +
 3*a*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + 3*b*ArcSin[c*x]*Cos[
(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + a*Cos[(8*a)/b]*SinIntegral[8*
(a/b + ArcSin[c*x])] + b*ArcSin[c*x]*Cos[(8*a)/b]*SinIntegral[8*(a/b + ArcS
in[c*x])])/(16*b^2*c^3*(a + b*ArcSin[c*x]))
```

Maple [A]
time = 0.11, size = 478, normalized size = 1.70

method	result
default	$\frac{16 \arcsin(cx) \operatorname{sinIntegral}\left(4 \arcsin(cx)+\frac{4a}{b}\right) \cos\left(\frac{4a}{b}\right) b-16 \arcsin(cx) \operatorname{cosineIntegral}\left(4 \arcsin(cx)+\frac{4a}{b}\right) \sin\left(\frac{4a}{b}\right) b+8 \arcsin(cx) \operatorname{sinIntegral}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/128/c^3*(16*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-16*arcsin(c*
x)*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+8*arcsin(c*x)*Si(8*arcsin(c*x)+8*a/
b)*cos(8*a/b)*b-8*arcsin(c*x)*Ci(8*arcsin(c*x)+8*a/b)*sin(8*a/b)*b-8*arcsin
(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b+8*arcsin(c*x)*Ci(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*b+24*arcsin(c*x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-24*a
rcsin(c*x)*Ci(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*b+16*Si(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)*a-16*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+8*Si(8*arcsin(c*x)+8*a
/b)*cos(8*a/b)*a-8*Ci(8*arcsin(c*x)+8*a/b)*sin(8*a/b)*a-8*Si(2*arcsin(c*x)+
2*a/b)*cos(2*a/b)*a+8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+24*Si(6*arcsin(c
*x)+6*a/b)*cos(6*a/b)*a-24*Ci(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*a+4*cos(4*arc
sin(c*x))*b+cos(8*arcsin(c*x))*b-4*cos(2*arcsin(c*x))*b+4*cos(6*arcsin(c*x)
)*b-5*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^8 - 3*c^4*x^6 + 3*c^2*x^4 - x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + a*b*c)*integrate(2*(4*c^6*x^7 - 9*c^4*x^5 + 6*c^2*x^3 - x
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^6 - 2*c^2*x^4 + x^2)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2
+ 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(-(cx-1)(cx+1))^{\frac{5}{2}}}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 2461 vs. $2(264) = 528$.
time = 0.56, size = 2461, normalized size = 8.73

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -8*b*arcsin(c*x)*cos(a/b)^7*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 8*b*arcsin(c*x)*cos(a/b)^8*sin_integral(8
*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 8*a*cos(a/b)^7*co
s_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + 8*a*cos(a/b)^8*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x)
 + a*b^2*c^3) + 12*b*arcsin(c*x)*cos(a/b)^5*cos_integral(8*a/b + 8*arcsin(c
*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 6*b*arcsin(c*x)*cos(a/b)^
5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2
*c^3) - 16*b*arcsin(c*x)*cos(a/b)^6*sin_integral(8*a/b + 8*arcsin(c*x))/(b^
3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*
a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 12*a*cos(a/b)^5*co
s_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) - 6*a*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*ar
csin(c*x) + a*b^2*c^3) - 16*a*cos(a/b)^6*sin_integral(8*a/b + 8*arcsin(c*x)
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^6*sin_integral(6*a/b + 6
*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 5*b*arcsin(c*x)*cos(a/b)^
3*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2
*c^3) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(
a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - b*arcsin(c*x)*cos(a/b)^3*cos_integ
ral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 10*
b*arcsin(c*x)*cos(a/b)^4*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) - 9*b*arcsin(c*x)*cos(a/b)^4*sin_integral(6*a/b + 6*arc
sin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*arcsin(c*x)*cos(a/b)^4*sin_
integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 5*a*cos
(a/b)^3*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) +
```

```
 a*b^2*c^3) + 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(
b^3*c^3*arcsin(c*x) + a*b^2*c^3) - a*cos(a/b)^3*cos_integral(4*a/b + 4*arcs
in(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 10*a*cos(a/b)^4*sin_i
ntegral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9*a*cos(
a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) + (c^2*x^2 - 1)^4*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*b*a
rcsin(c*x)*cos(a/b)*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) - 9/8*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6
*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*b*arcsin(c*x
)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x
) + a*b^2*c^3) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c
*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^
2*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2
7/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) - b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*a
rcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*b*arcsin(c*x)*cos(a/b)^
2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + (
c^2*x^2 - 1)^3*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*a*cos(a/b)*cos_int
egral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9
/8*a*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(
c*x) + a*b^2*c^3) + 1/2*a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(
a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*cos(a/b)*cos_integral(2*a/b
 + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^
2*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2
7/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) - a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arc
sin(c*x) + a*b^2*c^3) - 1/8*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x)
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*b*arcsin(c*x)*sin_integral(8*a/b
 + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3/16*b*arcsin(c*x)*si
n_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*b
*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b
^2*c^3) + 1/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) - 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*sin_integral(4*a/b + 4*arcsin(c*x))
/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(2*a/b + 2*arcsin(c
*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(1-c^2\,x^2\right)}^{5/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.401 $\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=276

$$-\frac{x(1-c^2x^2)^3}{bc(a+b\text{ArcSin}(cx))}+\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64b^2c^2}+\frac{27\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^2}+$$

```
[Out] -x*(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))+5/64*Ci((a+b*arcsin(c*x))/b)*cos(a/
b)/b^2/c^2+27/64*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^2+25/64*Ci(5*(a
+b*arcsin(c*x))/b)*cos(5*a/b)/b^2/c^2+7/64*Ci(7*(a+b*arcsin(c*x))/b)*cos(7*
a/b)/b^2/c^2+5/64*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^2+27/64*Si(3*(a+b*
arcsin(c*x))/b)*sin(3*a/b)/b^2/c^2+25/64*Si(5*(a+b*arcsin(c*x))/b)*sin(5*a/
b)/b^2/c^2+7/64*Si(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b^2/c^2
```

Rubi [A]

time = 0.54, antiderivative size = 276, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {4799, 4753, 3393, 3384, 3380, 3383, 4809, 4491}

$$\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64b^2c^2}+\frac{27\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^2}+\frac{25\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^2}+\frac{7\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^2}+\frac{5\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{64b^2c^2}+\frac{27\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^2}+\frac{25\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^2}+\frac{7\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\text{ArcSin}(cx))}{b}\right)}{64b^2c^2}-\frac{x(1-c^2x^2)^3}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[
(a + b*ArcSin[c*x])/b])/(64*b^2*c^2) + (27*Cos[(3*a)/b]*CosIntegral[(3*(a +
 b*ArcSin[c*x]))/b])/(64*b^2*c^2) + (25*Cos[(5*a)/b]*CosIntegral[(5*(a + b*
ArcSin[c*x]))/b])/(64*b^2*c^2) + (7*Cos[(7*a)/b]*CosIntegral[(7*(a + b*ArcS
in[c*x]))/b])/(64*b^2*c^2) + (5*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b]
)/(64*b^2*c^2) + (27*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(
64*b^2*c^2) + (25*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(64*
b^2*c^2) + (7*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b^2*
c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{\int \frac{(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{bc} - \frac{(7c)\int \frac{x^2(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{x(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \frac{\cos^5(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{7\text{Subst}\left(\int \frac{\cos^5(x)\sin^2(x)}{a+bx}\right.}{bc^2}$$

$$= -\frac{x(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \left(\frac{5\cos(x)}{8(a+bx)} + \frac{5\cos(3x)}{16(a+bx)} + \frac{\cos(5x)}{16(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{bc^2}$$

$$= -\frac{x(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc^2} + \frac{7\text{Subst}\left(\int \frac{\cos(3x)}{a+bx}\,dx, x\right.}{64bc^2}$$

$$= -\frac{x(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} - \frac{\left(35\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{64bc^2} + \frac{(5\cos}{}$$

$$= -\frac{x(1-c^2x^2)^3}{bc\,(a+b\sin^{-1}(cx))} + \frac{5\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{64b^2c^2} + \frac{27\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}\right.}{64b^2c^2}$$

Mathematica [A]
time = 0.66, size = 404, normalized size = 1.46

Antiderivative was successfully verified.

```
[In] Integrate[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-64*b*c*x + 192*b*c^3*x^3 - 192*b*c^5*x^5 + 64*b*c^7*x^7 + 5*(a + b*ArcSin
[c*x])*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + 27*(a + b*ArcSin[c*x])*Cos
[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + 25*a*Cos[(5*a)/b]*CosIntegra
l[5*(a/b + ArcSin[c*x])] + 25*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b
 + ArcSin[c*x])] + 7*a*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 7*
b*ArcSin[c*x]*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 5*a*Sin[a/b
]*SinIntegral[a/b + ArcSin[c*x]] + 5*b*ArcSin[c*x]*Sin[a/b]*SinIntegral[a/b
 + ArcSin[c*x]] + 27*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 27
*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 25*a*Sin[(
5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + 25*b*ArcSin[c*x]*Sin[(5*a)/b]*
SinIntegral[5*(a/b + ArcSin[c*x])] + 7*a*Sin[(7*a)/b]*SinIntegral[7*(a/b +
ArcSin[c*x])] + 7*b*ArcSin[c*x]*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*
x])])/(64*b^2*c^2*(a + b*ArcSin[c*x]))
```

Maple [A]
time = 0.11, size = 455, normalized size = 1.65

method	result
default	$\frac{7 \arcsin(cx) \operatorname{sinIntegral}\left(7 \arcsin(cx)+\frac{7a}{b}\right) \sin\left(\frac{7a}{b}\right) b+7 \arcsin(cx) \operatorname{cosineIntegral}\left(7 \arcsin(cx)+\frac{7a}{b}\right) \cos\left(\frac{7a}{b}\right) b+25 \arcsin(cx) \operatorname{sinIntegra}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/64/c^2*(7*arcsin(c*x)*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*b+7*arcsin(c*x)*
Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*b+25*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)
*sin(5*a/b)*b+25*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b+27*arcsin
(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+27*arcsin(c*x)*Ci(3*arcsin(c*x)+
3*a/b)*cos(3*a/b)*b+5*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+5*arcsin(c
*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+7*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*a+7
*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*a+25*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)
*a+25*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a+27*Si(3*arcsin(c*x)+3*a/b)*sin(3
*a/b)*a+27*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+5*Si(arcsin(c*x)+a/b)*sin(a
/b)*a+5*Ci(arcsin(c*x)+a/b)*cos(a/b)*a-5*x*b*c-sin(7*arcsin(c*x))*b-5*sin(5
*arcsin(c*x))*b-9*sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^7 - 3*c^4*x^5 + 3*c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)*integrate((7*c^6*x^6 - 15*c^4*x^4 + 9*c^2*x^2 - 1)/(b^2*
c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x) - x)/(b^2*c*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^5 - 2*c^2*x^3 + x)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 +
2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(-(cx-1)(cx+1))^{\frac{5}{2}}}{(a+b\,\text{asin}\,(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2026 vs. 2(258) = 516.
time = 0.53, size = 2026, normalized size = 7.34

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 7*b*arcsin(c*x)*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 7*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(7*
a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 7*a*cos(a/b)^7*cos
_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 7*a*co
s(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) - 49/4*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b + 7*arcsin(
c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/4*b*arcsin(c*x)*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 35/4*b
*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^2*arcsin(c*x) + a*b^2*c^2) + 25/4*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_in
tegral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/4*a*co
s(a/b)^5*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c
^2) + 25/4*a*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) - 35/4*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/4*a*cos(a/b)^4*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + (c^2*x
^2 - 1)^3*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 49/8*b*arcsin(c*x)*cos(
a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2
) - 125/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^
3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*b*arcsin(c*x)*cos(a/b)^3*cos_integra
l(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 21/8*b*arcsin(
c*x)*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsi
n(c*x) + a*b^2*c^2) - 75/16*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(
5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*b*arcsin(c
*x)*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin
```

```
(c*x) + a*b^2*c^2) + 49/8*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/
(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 125/16*a*cos(a/b)^3*cos_integral(5*a/b
+ 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*a*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 21/8*a
*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 75/16*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin
(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*a*cos(a/b)^2*sin(a/b)*sin_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/64*b
*arcsin(c*x)*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c
*x) + a*b^2*c^2) + 125/64*b*arcsin(c*x)*cos(a/b)*cos_integral(5*a/b + 5*arc
sin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 81/64*b*arcsin(c*x)*cos(a/b)*
cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/6
4*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 7/64*b*arcsin(c*x)*sin(a/b)*sin_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/64*b*arcsin(c*x)*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/64*
b*arcsin(c*x)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 5/64*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c
*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/64*a*cos(a/b)*cos_integral(7*a/
b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 125/64*a*cos(a/b)*co
s_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 81/64
*a*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^
2*c^2) + 5/64*a*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 7/64*a*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*
c^2*arcsin(c*x) + a*b^2*c^2) + 25/64*a*sin(a/b)*sin_integral(5*a/b + 5*arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/64*a*sin(a/b)*sin_integral(
3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/64*a*sin(a/b)*
sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,{\left(1-c^2\,x^2\right)}^{5/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
[Out] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.402 $\int \frac{(1-c^2x^2)^{5/2}}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=217

$$-\frac{(1-c^2x^2)^3}{bc(a+b\mathrm{ArcSin}(cx))}+\frac{15\mathrm{CosIntegral}\left(\frac{2(a+b\mathrm{ArcSin}(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c}+\frac{3\mathrm{CosIntegral}\left(\frac{4(a+b\mathrm{ArcSin}(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{4b^2c}+$$

```
[Out] -(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))-15/16*cos(2*a/b)*Si(2*(a+b*arcsin(c*x
))/b)/b^2/c-3/4*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c-3/16*cos(6*a/b)*
Si(6*(a+b*arcsin(c*x))/b)/b^2/c+15/16*Ci(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/
b^2/c+3/4*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c+3/16*Ci(6*(a+b*arcsin(
c*x))/b)*sin(6*a/b)/b^2/c
```

Rubi [A]
time = 0.24, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.240$, Rules used = {4751, 4809, 4491, 3384, 3380, 3383}

$$\frac{15\sin\left(\frac{2a}{b}\right)\mathrm{CosIntegral}\left(\frac{2(a+b\mathrm{ArcSin}(cx))}{b}\right)}{16b^2c}+\frac{3\sin\left(\frac{4a}{b}\right)\mathrm{CosIntegral}\left(\frac{4(a+b\mathrm{ArcSin}(cx))}{b}\right)}{4b^2c}+\frac{3\sin\left(\frac{6a}{b}\right)\mathrm{CosIntegral}\left(\frac{6(a+b\mathrm{ArcSin}(cx))}{b}\right)}{16b^2c}-\frac{15\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(\frac{2(a+b\mathrm{ArcSin}(cx))}{b}\right)}{16b^2c}-\frac{3\cos\left(\frac{4a}{b}\right)\mathrm{Si}\left(\frac{4(a+b\mathrm{ArcSin}(cx))}{b}\right)}{4b^2c}-\frac{3\cos\left(\frac{6a}{b}\right)\mathrm{Si}\left(\frac{6(a+b\mathrm{ArcSin}(cx))}{b}\right)}{16b^2c}-\frac{(1-c^2x^2)^3}{bc(a+b\mathrm{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*(a + b*ArcSin[c*x]))) + (15*CosIntegral[(2*(a + b*Ar
cSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c) + (3*CosIntegral[(4*(a + b*ArcSin[c
*x]))/b]*Sin[(4*a)/b])/(4*b^2*c) + (3*CosIntegral[(6*(a + b*ArcSin[c*x]))/b
]*Sin[(6*a)/b])/(16*b^2*c) - (15*Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[
c*x]))/b])/(16*b^2*c) - (3*Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))
/b])/(4*b^2*c) - (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(1
6*b^2*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{(6c)\int \frac{x\left(1-c^2x^2\right)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{6\text{Subst}\left(\int \frac{\cos^5(x)\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{6\text{Subst}\left(\int \left(\frac{5\sin(2x)}{32(a+bx)} + \frac{\sin(4x)}{8(a+bx)} + \frac{\sin(6x)}{32(a+bx)}\right)\,dx, x, \sin^{-1}(cx)\right.}{bc}$$

$$= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{3\text{Subst}\left(\int \frac{\sin(6x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc} - \frac{3\text{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx,\right.}{4bc}$$

$$= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} - \frac{\left(15\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16bc} - \frac{(3\,\text{co}}{}$$

$$= -\frac{\left(1-c^2x^2\right)^3}{bc\left(a+b\sin^{-1}(cx)\right)} + \frac{15\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{16b^2c} + \frac{3\text{Ci}\left(\frac{4a}{b}+4\sin^{-1}(cx)\right)\,\text{s}}{4b^2c}$$

Mathematica [A]
time = 0.56, size = 311, normalized size = 1.43

$$-\frac{16b-48bc^2x^2+48bc^4x^4-16bc^6x^6-15(a+b\text{ArcSin}(cx))\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{2a}{b}\right)-12(a+b\text{ArcSin}(cx))\text{CosIntegral}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{4a}{b}\right)-3a\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{6a}{b}\right)-3b\text{ArcSin}(cx)\text{CosIntegral}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{6a}{b}\right)+15a\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+15b\text{ArcSin}(cx)\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+12a\cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+12b\text{ArcSin}(cx)\cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+3a\cos\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+3b\text{ArcSin}(cx)\cos\left(\frac{6a}{b}\right)\text{Si}\left(6\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16b^2c(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/16*(16*b - 48*b*c^2*x^2 + 48*b*c^4*x^4 - 16*b*c^6*x^6 - 15*(a + b*ArcSin
[c*x])*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] - 12*(a + b*ArcSin[c
*x])*CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 3*a*CosIntegral[6*(a
/b + ArcSin[c*x])]*Sin[(6*a)/b] - 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcS
in[c*x])]*Sin[(6*a)/b] + 15*a*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x]
)] + 15*b*ArcSin[c*x]*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 12*
a*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] + 12*b*ArcSin[c*x]*Cos[(4
*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] + 3*a*Cos[(6*a)/b]*SinIntegral[6*
(a/b + ArcSin[c*x])] + 3*b*ArcSin[c*x]*Cos[(6*a)/b]*SinIntegral[6*(a/b + Ar
cSin[c*x])])/(b^2*c*(a + b*ArcSin[c*x]))
```

Maple [A]
time = 0.12, size = 364, normalized size = 1.68

method	result

default	$-\frac{6\arcsin(cx)\,\mathrm{sinIntegral}\left(6\arcsin(cx)+\frac{6a}{b}\right)\cos\left(\frac{6a}{b}\right)b-6\arcsin(cx)\,\mathrm{cosineIntegral}\left(6\arcsin(cx)+\frac{6a}{b}\right)\sin\left(\frac{6a}{b}\right)b+24\arcsin(cx)\,\mathrm{sinInte}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/32/c*(6*arcsin(c*x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-6*arcsin(c*x)*C
i(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*b+24*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)*b-24*arcsin(c*x)*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+30*arcsin(
c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-30*arcsin(c*x)*Ci(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*b+6*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*a-6*Ci(6*arcsin(c*x
)+6*a/b)*sin(6*a/b)*a+24*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-24*Ci(4*arcsi
n(c*x)+4*a/b)*sin(4*a/b)*a+30*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-30*Ci(2*
arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(6*arcsin(c*x))*b+6*cos(4*arcsin(c*x))*b
+15*cos(2*arcsin(c*x))*b+10*b)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)*integrate(6*(c^5*x^5 - 2*c^3*x^3 + c*x)/(b^2*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b), x) - 1)/(b^2*c*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 +
2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 1394 vs. $2(203) = 406$.
time = 0.52, size = 1394, normalized size = 6.42

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^
3*c*arcsin(c*x) + a*b^2*c) - 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*a/b
+ 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^5*cos_integra
l(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 6*a*cos(a
/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 6
*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3
*c*arcsin(c*x) + a*b^2*c) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b +
 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 9*b*arcsin(c*x)*co
s(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
- 6*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arc
sin(c*x) + a*b^2*c) - 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*si
n(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^3*cos_integral(4*a/b +
4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 9*a*cos(a/b)^4*sin_
integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 6*a*cos(a/b
)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 9/8
*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c
*arcsin(c*x) + a*b^2*c) - 3*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*a
rcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 15/8*b*arcsin(c*x)*cos
(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b
^2*c) - 27/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(
b^3*c*arcsin(c*x) + a*b^2*c) + 6*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/
b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 15/8*b*arcsin(c*x)*cos(a
/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + (
c^2*x^2 - 1)^3*b/(b^3*c*arcsin(c*x) + a*b^2*c) + 9/8*a*cos(a/b)*cos_integra
l(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 3*a*cos(a
/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2
*c) + 15/8*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*a
rcsin(c*x) + a*b^2*c) - 27/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x
))/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^2*sin_integral(4*a/b + 4*ar
csin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 15/8*a*cos(a/b)^2*sin_integral(2
*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 3/16*b*arcsin(c*x)*si
```

```
n_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 3/4*b*arc
sin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
+ 15/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c) + 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c) - 3/4*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x)
 + a*b^2*c) + 15/16*a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(1-c^2\,x^2\right)^{5/2}}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x))^2,x)
[Out] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x))^2, x)
```

3.403 $\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\textbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=235

$$-\frac{(1-c^2x^2)^3}{bcx(a+b\text{ArcSin}(cx))}-\frac{25\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2}-\frac{25\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2}$$

```
[Out] -(-c^2*x^2+1)^3/b/c/x/(a+b*arcsin(c*x))-25/8*Ci((a+b*arcsin(c*x))/b)*cos(a/
b)/b^2-25/16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2-5/16*Ci(5*(a+b*arcsin
(c*x))/b)*cos(5*a/b)/b^2-25/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2-25/16*Si
(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2-5/16*Si(5*(a+b*arcsin(c*x))/b)*sin(5
*a/b)/b^2-Unintegrable((-c^2*x^2+1)^2/x^2/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [A]
time = 0.34, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*x*(a + b*ArcSin[c*x]))) - (25*Cos[a/b]*CosIntegral[(
a + b*ArcSin[c*x])/b])/(8*b^2) - (25*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(16*b^2) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x]
))/b])/(16*b^2) - (25*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b^2)
- (25*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^2) - (5*Si
n[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2) - Defer[Int][(1
 - c^2*x^2)^2/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\sin^{-1}(cx))^2}\,dx = -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\sin^{-1}(cx))}\,dx}{bc} - \frac{(5c)\int \frac{(1-c^2x^2)^2}{a+b\sin^{-1}(cx)}\,dx}{b}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{5\text{Subst}\left(\int \frac{\cos^5(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\sin^{-1}(cx))}}{bc}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{5\text{Subst}\left(\int \left(\frac{5\cos(x)}{8(a+bx)} + \frac{5\cos(3x)}{16(a+bx)} + \frac{\cos(5x)}{16(a+bx)}\right)\,dx, x, \sin^{-1}\right.}{b}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{5\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{16b} - \frac{25\text{Subst}\left(\int \frac{\cos(3}{a+b}\right.}{}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\sin^{-1}(cx))}\,dx}{bc} - \frac{\left(25\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\right.}{8b}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\sin^{-1}(cx))} - \frac{25\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2} - \frac{25\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\right.}{16b^2}$$

Mathematica [A]
time = 8.90, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.86, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1)) + a*b*c*x)*integrate((5*c^6*x^6 - 9*c^4*x^4 + 3*c^2*x^2 + 1)/(b
^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) - 1)/(
b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x*arcsin(c*x)^2
+ 2*a*b*x*arcsin(c*x) + a^2*x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-(cx-1)(cx+1))^{\frac{5}{2}}}{x\left(a+b\operatorname{asin}(cx)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))^2), x)
```

3.404 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\textbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=106

$$-\frac{(1-c^2x^2)^3}{bcx^2(a+b\text{ArcSin}(cx))}-\frac{2\text{Int}\left(\frac{(1-c^2x^2)^2}{x^3(a+b\text{ArcSin}(cx))},x\right)}{bc}-\frac{4c\text{Int}\left(\frac{(1-c^2x^2)^2}{x(a+b\text{ArcSin}(cx))},x\right)}{b}$$

```
[Out] -(-c^2*x^2+1)^3/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable((-c^2*x^2+1)^2/x^3
/(a+b*arcsin(c*x)),x)/b/c-4*c*Unintegrable((-c^2*x^2+1)^2/x/(a+b*arcsin(c*x
)),x)/b
```

Rubi [A]
time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][(1 - c^2*x
^2)^2/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (4*c*Defer[Int][(1 - c^2*x^2)^
2/(x*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{(1-c^2x^2)^3}{bcx^2\left(a+b\sin^{-1}(cx)\right)}-\frac{2\int \frac{(1-c^2x^2)^2}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}-\frac{(4c)\int \frac{(1-c^2x^2)^2}{x\left(a+b\sin^{-1}(cx)\right)}\,dx}{b}$$

Mathematica [A]
time = 2.39, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.77, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^2 (a+b \arcsin(cx))^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^2)*integrate(2*(2*c^6*x^6 - 3*c^4*x^4 + 1)/(b^2*c*x
^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3), x) - 1)/(b^2*c*
x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^2*arcsin(c*x)^
2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-(cx-1)(cx+1))^{\frac{5}{2}}}{x^2 (a+b \operatorname{asin}(cx))^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**2*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))^2), x)
```

3.405 $\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3(a+b\textbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^3(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 11.27, size = 0, normalized size = 0.00

$$\int \frac{\left(1-c^2x^2\right)^{5/2}}{x^3(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 3.67, size = 0, normalized size = 0.00

$$\int \frac{\left(-c^2x^2+1\right)^{\frac{5}{2}}}{x^3\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^3)*integrate(3*(c^6*x^6 - c^4*x^4 - c^2*x^2 + 1)/(b
^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4), x) - 1)/(
b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^3*arcsin(c*x)^
2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}{x^{3}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**3*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(1-c^2\,x^2\right)^{5/2}}{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))^2),x)
```

```
[Out] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))^2), x)
```

3.406 $\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^4\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 2.10, size = 0, normalized size = 0.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 4.27, size = 0, normalized size = 0.00

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^4\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^4)*integrate(2*(c^6*x^6 - 3*c^2*x^2 + 2)/(b^2*c*x^5
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^5), x) - 1)/(b^2*c*x^
4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^4*arcsin(c*x)^
2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}{x^{4}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**4/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**4*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x^4), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{(1-c^2 x^2)^{5/2}}{x^4 (a+b \operatorname{asin}(c x))^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))^2), x)
```

3.407 $\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=49

$$-\frac{x^m}{bc(a+b\text{ArcSin}(cx))}+\frac{m\text{Int}\left(\frac{x^{-1+m}}{a+b\text{ArcSin}(cx)},x\right)}{bc}$$

```
[Out] -x^m/b/c/(a+b*arcsin(c*x))+m*Unintegrable(x^(-1+m)/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [A]
time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^m/(b*c*(a + b*ArcSin[c*x]))) + (m*Defer[Int][x^(-1 + m)/(a + b*ArcSin[c
*x]), x])/(b*c)
```

Rubi steps

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{x^m}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{m\int \frac{x^{-1+m}}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

Mathematica [A]
time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.72, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a+b\arcsin\left(cx\right)\right)^2\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] ((b^2*c*m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*m)*integrate(x
^m/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x), x) - x^m
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^m}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{1-c^2\,x^2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.408 $\int \frac{x^5}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=204

$$-\frac{x^5}{bc(a+b\text{ArcSin}(cx))}+\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^6}-\frac{15\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^6}+\cdots$$

```
[Out] -x^5/b/c/(a+b*arcsin(c*x))+5/8*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2/c^6-15/
16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^6+5/16*Ci(5*(a+b*arcsin(c*x))
/b)*cos(5*a/b)/b^2/c^6+5/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^6-15/16*S
i(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^6+5/16*Si(5*(a+b*arcsin(c*x))/b)*
sin(5*a/b)/b^2/c^6
```

Rubi [A]
time = 0.29, antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4807, 4731, 4491, 3384, 3380, 3383}

$$\frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^6}-\frac{15\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^6}+\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^6}+\frac{5\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^6}-\frac{15\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^6}+\frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^6}-\frac{x^5}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^5/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*
x])/b])/(8*b^2*c^6) - (15*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c*x]))/
b])/(16*b^2*c^6) + (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x]))/b])/
(16*b^2*c^6) + (5*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b^2*c^6)
- (15*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^6) + (
5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^6)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{x^5}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\int \frac{x^4}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\text{Subst}\left(\int \frac{\cos(x)\sin^4(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^6}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\text{Subst}\left(\int \left(\frac{\cos(x)}{8(a+bx)}-\frac{3\cos(3x)}{16(a+bx)}+\frac{\cos(5x)}{16(a+bx)}\right)\,dx\right.}{bc^6}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\text{Subst}\left(\int \frac{\cos(5x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{16bc^6}+\frac{5\text{Subst}}{}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx\right.}{8bc^6}$$

$$= -\frac{x^5}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{5\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8b^2c^6}-\frac{15\cos\left(\frac{3a}{b}\right)\text{C}}{}$$

Mathematica [A]
time = 0.25, size = 157, normalized size = 0.77

$$-\frac{x^5}{bc(a+b\text{ArcSin}(cx))}+\frac{5\left(2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)-3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)-3\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\sin\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\right)}{16b^2c^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^5/(b*c*(a + b*ArcSin[c*x]))) + (5*(2*Cos[a/b]*CosIntegral[a/b + ArcSin[
c*x]] - 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Cos[(5*a)/b]*Co
sIntegral[5*(a/b + ArcSin[c*x])] + 2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]
] - 3*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + Sin[(5*a)/b]*SinInt
egral[5*(a/b + ArcSin[c*x])]))/(16*b^2*c^6)
```

Maple [A]
time = 0.12, size = 341, normalized size = 1.67

method	result
default	$5\arcsin(cx)\,\text{sinIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)b+5\arcsin(cx)\,\text{cosineIntegral}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)b-15\arcsin(cx)\,\text{sinIntegral}($

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/c^6*(5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c*x)*
Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-15*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)
*sin(3*a/b)*b-15*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+10*arcsin
(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+10*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos
(a/b)*b+5*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*co
s(5*a/b)*a-15*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-15*Ci(3*arcsin(c*x)+3*a/
b)*cos(3*a/b)*a+10*Si(arcsin(c*x)+a/b)*sin(a/b)*a+10*Ci(arcsin(c*x)+a/b)*co
s(a/b)*a-10*x*b*c-sin(5*arcsin(c*x))*b+5*sin(3*arcsin(c*x))*b)/(a+b*arcsin(
c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^5 - 5*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^4/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^5/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\,\left(a+b\,\mathrm{asin}\,(cx)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x**5/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^5/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.409 $\int \frac{x^4}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=141

$$-\frac{x^4}{bc(a+b\text{ArcSin}(cx))}-\frac{\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c^5}+\frac{\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^5}+\text{cos}$$

```
[Out] -x^4/b/c/(a+b*arcsin(c*x))+cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/c^5-1/2
*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c^5-Ci(2*(a+b*arcsin(c*x))/b)*sin
(2*a/b)/b^2/c^5+1/2*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^5
```

Rubi [A]
time = 0.22, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4807, 4731, 4491, 3384, 3380, 3383}

$$-\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c^5}+\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c^5}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c^5}-\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c^5}-\frac{x^4}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^4/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*(a + b*ArcSin[c*x]))/b]*
Sin[(2*a)/b])/(b^2*c^5) + (CosIntegral[(4*(a + b*ArcSin[c*x]))/b]*Sin[(4*a)
/b])/(2*b^2*c^5) + (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b
^2*c^5) - (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(2*b^2*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{x^4}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}\,dx = -\frac{x^4}{bc\,(a+b\sin^{-1}(cx))} + \frac{4\int \frac{x^3}{a+b\sin^{-1}(cx)}\,dx}{bc}$$

$$= -\frac{x^4}{bc\,(a+b\sin^{-1}(cx))} + \frac{4\mathrm{Subst}\left(\int \frac{\cos(x)\sin^3(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^5}$$

$$= -\frac{x^4}{bc\,(a+b\sin^{-1}(cx))} + \frac{4\mathrm{Subst}\left(\int \left(\frac{\sin(2x)}{4(a+bx)} - \frac{\sin(4x)}{8(a+bx)}\right)\,dx, x, \sin^{-1}(c\right.}{bc^5}$$

$$= -\frac{x^4}{bc\,(a+b\sin^{-1}(cx))} - \frac{\mathrm{Subst}\left(\int \frac{\sin(4x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{2bc^5} + \frac{\mathrm{Subst}\left(\int\right.}{}$$

$$= -\frac{x^4}{bc\,(a+b\sin^{-1}(cx))} + \frac{\cos\left(\frac{2a}{b}\right)\mathrm{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc^5}$$

$$= -\frac{x^4}{bc\,(a+b\sin^{-1}(cx))} - \frac{\mathrm{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c^5} + \frac{\mathrm{Ci}\left(\frac{4a}{b}+4\,\mathrm{si}\right.}{}$$

Mathematica [A]
time = 0.22, size = 117, normalized size = 0.83

$$\frac{-\frac{2bc^4x^4}{a+b\mathrm{ArcSin}(cx)} - 2\mathrm{CosIntegral}\left(2\left(\frac{a}{b}+\mathrm{ArcSin}(cx)\right)\right)\sin\left(\frac{2a}{b}\right) + \mathrm{CosIntegral}\left(4\left(\frac{a}{b}+\mathrm{ArcSin}(cx)\right)\right)\sin\left(\frac{4a}{b}\right) + 2\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\left(\frac{a}{b}+\mathrm{ArcSin}(cx)\right)\right) - \cos\left(\frac{4a}{b}\right)\mathrm{Si}\left(4\left(\frac{a}{b}+\mathrm{ArcSin}(cx)\right)\right)}{2b^2c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] ((-2*b*c^4*x^4)/(a + b*ArcSin[c*x]) - 2*CosIntegral[2*(a/b + ArcSin[c*x])]*
Sin[(2*a)/b] + CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 2*Cos[(2*a
)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b +
 ArcSin[c*x])])/(2*b^2*c^5)
```

Maple [A]
time = 0.12, size = 250, normalized size = 1.77

method	result
default	$-\frac{4\arcsin(cx)\,\mathrm{sinIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-4\arcsin(cx)\,\mathrm{cosineIntegral}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b-8\arcsin(cx)\,\mathrm{sinIntegra}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c^5*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*
Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b-8*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*
cos(2*a/b)*b+8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+4*Si(4*arcs
in(c*x)+4*a/b)*cos(4*a/b)*a-4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a-8*Si(2*a
rcsin(c*x)+2*a/b)*cos(2*a/b)*a+8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(4
*arcsin(c*x))*b-4*cos(2*arcsin(c*x))*b+3*b)/b^2/(a+b*arcsin(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^4 - 4*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^3/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^4/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\,\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**4/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 876 vs. 2(137) = 274.
time = 0.51, size = 876, normalized size = 6.21

$$\frac{4b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{4b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}+\frac{4a\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{4a\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{2b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{2b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}+\frac{4b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}+\frac{2b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{2a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{2a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}+\frac{4a\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}+\frac{2a\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{\left(c^2x^2-1\right)^2b}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{b\arcsin\left(cx\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2\left(b^3c^5\arcsin\left(cx\right)+ab^2c^5\right)}-\frac{b\arcsin\left(cx\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{2\left(c^2x^2-1\right)b}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{a\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2\left(b^3c^5\arcsin\left(cx\right)+ab^2c^5\right)}-\frac{a\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}-\frac{b}{b^3c^5\arcsin\left(cx\right)+ab^2c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^
3*c^5*arcsin(c*x) + a*b^2*c^5) - 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*
a/b + 4*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 4*a*cos(a/b)^3*cos
_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
 - 4*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*arcsin(c*x)
+ a*b^2*c^5) - 2*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))
*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*b*arcsin(c*x)*cos(a/b)*cos_
integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
+ 4*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*a
rcsin(c*x) + a*b^2*c^5) + 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2
*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*a*cos(a/b)*cos_integral
(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*a*co
s(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) +
a*b^2*c^5) + 4*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*ar
csin(c*x) + a*b^2*c^5) + 2*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))
/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - (c^2*x^2 - 1)^2*b/(b^3*c^5*arcsin(c*x)
 + a*b^2*c^5) - 1/2*b*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*
c^5*arcsin(c*x) + a*b^2*c^5) - b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(
c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*(c^2*x^2 - 1)*b/(b^3*c^5*arcsin
(c*x) + a*b^2*c^5) - 1/2*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*arc
sin(c*x) + a*b^2*c^5) - a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^5*arcs
in(c*x) + a*b^2*c^5) - b/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^4/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.410 $\int \frac{x^3}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=142

$$-\frac{x^3}{bc(a+b\text{ArcSin}(cx))}+\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^4}-\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^4}+$$

```
[Out] -x^3/b/c/(a+b*arcsin(c*x))+3/4*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2/c^4-3/4
*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4+3/4*Si((a+b*arcsin(c*x))/b)*s
in(a/b)/b^2/c^4-3/4*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^4
```

Rubi [A]
time = 0.22, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4807, 4731, 4491, 3384, 3380, 3383}

$$\frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^4}-\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^4}+\frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^4}-\frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^4}-\frac{x^3}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^3/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*
x])/b])/(4*b^2*c^4) - (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(4*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^4
) - (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^3}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx}{bc}\\
&= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^4}\\
&= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)}-\frac{\cos(3x)}{4(a+bx)}\right)\,dx,x,\sin^{-1}(cx\right.}{bc^4}\\
&= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4bc^4}-\frac{3\text{Subst}\left(\right.}{}\\
&= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{4bc^4}\\
&= -\frac{x^3}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{3\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4b^2c^4}-\frac{3\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\right.}{4b}
\end{aligned}
$$

Mathematica [A]
time = 0.19, size = 113, normalized size = 0.80

$$-\frac{x^3}{bc(a+b\text{ArcSin}(cx))}+\frac{3\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)-\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)-\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\right)}{4b^2c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^3/(b*c*(a + b*ArcSin[c*x]))) + (3*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*
x]] - Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Sin[a/b]*SinIntegra
l[a/b + ArcSin[c*x]] - Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]))/(4
*b^2*c^4)
```

Maple [A]
time = 0.11, size = 227, normalized size = 1.60

method	result
default	$-\frac{3\arcsin(cx)\,\mathrm{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b+3\arcsin(cx)\,\mathrm{cosineIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)b-3\arcsin(cx)\,\mathrm{sinInteg}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c^4*(3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+3*arcsin(c*x)*
Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b-3*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(
a/b)*b-3*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+3*Si(3*arcsin(c*x)+3*a/
b)*sin(3*a/b)*a+3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a-3*Si(arcsin(c*x)+a/b
)*sin(a/b)*a-3*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+3*x*b*c-sin(3*arcsin(c*x))*b)
/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^3 - 3*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^2/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\sqrt{-(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{(a+b\,\mathrm{asin}\,(c\,x))^2\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.411 $\int \frac{x^2}{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=79

$$-\frac{x^2}{bc(a+b\text{ArcSin}(cx))}-\frac{\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c^3}$$

```
[Out] -x^2/b/c/(a+b*arcsin(c*x))+cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/c^3-Ci(
2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c^3
```

Rubi [A]
time = 0.15, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4807, 4731, 4491, 12, 3384, 3380, 3383}

$$-\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\text{ArcSin}(cx))}{b}\right)}{b^2c^3}-\frac{x^2}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^2/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*(a + b*ArcSin[c*x]))/b]*
Sin[(2*a)/b])/(b^2*c^3) + (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))
/b])/(b^2*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\int \frac{x}{a+b\sin^{-1}(cx)}\,dx}{bc}\\
&= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}\\
&= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{2\text{Subst}\left(\int \frac{\sin(2x)}{2(a+bx)}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}\\
&= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Subst}\left(\int \frac{\sin(2x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}\\
&= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}+2x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc^3}\\
&= -\frac{x^2}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Ci}\left(\frac{2a}{b}+2\sin^{-1}(cx)\right)\sin\left(\frac{2a}{b}\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}\ldots\right.}{b\ldots}
\end{aligned}
$$

Mathematica [A]
time = 0.12, size = 70, normalized size = 0.89

$$\frac{-\frac{bc^2x^2}{a+b\text{ArcSin}(cx)}-\text{CosIntegral}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] (-((b*c^2*x^2)/(a + b*ArcSin[c*x])) - CosIntegral[2*(a/b + ArcSin[c*x])]*Si
n[(2*a)/b] + Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b^2*c^3)
```

Maple [A]
time = 0.11, size = 136, normalized size = 1.72

method	result
default	$\frac{2\arcsin(cx)\,\text{sinIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-2\arcsin(cx)\,\text{cosineIntegral}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b+2\,\text{sinIntegral}\left(2\arcsin(c\right.}{2c^3b^2(a+b\arcsin(cx))}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c^3*(2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-2*arcsin(c*x)*C
i(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-
2*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(2*arcsin(c*x))*b-b)/b^2/(a+b*arc
sin(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^2 - 2*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*
c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 346 vs. 2(79) = 158.
time = 0.50, size = 346, normalized size = 4.38

$$-\frac{2\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3}+\frac{2\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3}-\frac{2\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3}+\frac{2\,a\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3}-\frac{b\arcsin(cx)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3}-\frac{(c^2x^2-1)b}{b^3c^3\arcsin(cx)+ab^2c^3}-\frac{a\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3}-\frac{b}{b^3c^3\arcsin(cx)+ab^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3
*c^3*arcsin(c*x) + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a
/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)*cos_in
tegral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) +
2*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a
*b^2*c^3) - b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcs
in(c*x) + a*b^2*c^3) - (c^2*x^2 - 1)*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) -
a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - b
/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{(a+b\operatorname{asin}(c\,x))^2\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.412 $\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=72

$$-\frac{x}{bc(a+b\text{ArcSin}(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c^2}$$

```
[Out] -x/b/c/(a+b*arcsin(c*x))+Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2/c^2+Si((a+b*a
rcsin(c*x))/b)*sin(a/b)/b^2/c^2
```

Rubi [A]
time = 0.11, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {4807, 4719, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c^2}-\frac{x}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/
b])/(b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
```

```
, n}, x]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}\,dx &= -\frac{x}{bc\,(a+b\sin^{-1}(cx))}+\frac{\int \frac{1}{a+b\sin^{-1}(cx)}\,dx}{bc}\\
&= -\frac{x}{bc\,(a+b\sin^{-1}(cx))}+\frac{\operatorname{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{b^2c^2}\\
&= -\frac{x}{bc\,(a+b\sin^{-1}(cx))}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\sin^{-1}(cx)\right)}{b^2c^2}\\
&= -\frac{x}{bc\,(a+b\sin^{-1}(cx))}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\sin^{-1}}{b}\right.}{b^2c^2}
\end{aligned}$$

Mathematica [A]
time = 0.08, size = 59, normalized size = 0.82

$$\frac{-\frac{bcx}{a+b\text{ArcSin}(cx)}+\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)}{b^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] (-((b*c*x)/(a + b*ArcSin[c*x])) + Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] +
 Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c^2)
```

Maple [A]
time = 0.12, size = 108, normalized size = 1.50

method	result

default	$\frac{\arcsin(cx)\,\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\arcsin(cx)\,\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right.}{c^2(a+b\arcsin(cx))b^2}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/c^2*(arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+Si(arcsin(c*x)+a/b)*sin(a/b)*a+Ci(arcsin(c*x)+a/b)*cos(a/b)*a-x*b*c)/(a+b*arcsin(c*x))/b^2

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] ((b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(1/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x) - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)

[Out] Integral(x/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 200 vs. 2(72) = 144.
time = 0.51, size = 200, normalized size = 2.78

$$\frac{b \arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}+\frac{b \arcsin(cx)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}-\frac{bcx}{b^3c^2\arcsin(cx)+ab^2c^2}+\frac{a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}+\frac{a\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x)
 + a*b^2*c^2) + b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3
*c^2*arcsin(c*x) + a*b^2*c^2) - b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + a
*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
 + a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*
c^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{(a+b\,\mathrm{asin}\,(c\,x))^2\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.413 $\int \frac{1}{\sqrt{1-c^2x^2}\,(a+b\,\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=18

$$-\frac{1}{bc(a+b\text{ArcSin}(cx))}$$

```
[Out] -1/b/c/(a+b*arcsin(c*x))
```

Rubi [A]
time = 0.03, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {4737}

$$-\frac{1}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] -(1/(b*c*(a + b*ArcSin[c*x])))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx = -\frac{1}{bc\left(a+b\sin^{-1}(cx)\right)}$$

Mathematica [A]
time = 0.01, size = 18, normalized size = 1.00

$$-\frac{1}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] -(1/(b*c*(a + b*ArcSin[c*x])))
```

Maple [A]
time = 0.10, size = 19, normalized size = 1.06

method	result	size
derivativedivides	$-\frac{1}{bc(a+b\arcsin(cx))}$	19
default	$-\frac{1}{bc(a+b\arcsin(cx))}$	19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/b/c/(a+b*arcsin(c*x))
```

Maxima [A]
time = 0.47, size = 18, normalized size = 1.00

$$-\frac{1}{(b\arcsin(cx)+a)bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] -1/((b*arcsin(c*x) + a)*b*c)
```

Fricas [A]
time = 1.36, size = 18, normalized size = 1.00

$$-\frac{1}{b^2c\arcsin(cx)+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] -1/(b^2*c*arcsin(c*x) + a*b*c)
```

Sympy [C] Result contains complex when optimal does not.
time = 1.51, size = 53, normalized size = 2.94

$$\begin{cases} \frac{x}{a^2} & \text{for } b=0 \wedge c=0 \\ \frac{\begin{cases} -\frac{i\operatorname{acosh}(cx)}{c} & \text{for } |c^2x^2|>1 \\ \frac{\operatorname{asin}(cx)}{c} & \text{otherwise} \end{cases}}{a^2} & \text{for } b=0 \\ \frac{x}{a^2} & \text{for } c=0 \\ -\frac{1}{abc+b^2c\operatorname{asin}(cx)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x/a**2, Eq(b, 0) & Eq(c, 0)), (Piecewise((-I*acosh(c*x)/c, Abs(c
**2*x**2) > 1), (asin(c*x)/c, True))/a**2, Eq(b, 0)), (x/a**2, Eq(c, 0)), (
-1/(a*b*c + b**2*c*asin(c*x)), True))
```

Giac [A]
time = 0.50, size = 18, normalized size = 1.00

$$-\frac{1}{b^2c \arcsin(cx) + abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/(b^2*c*arcsin(c*x) + a*b*c)
```

Mupad [B]
time = 0.17, size = 18, normalized size = 1.00

$$-\frac{1}{c \operatorname{asin}(c\,x)\;b^2 + a\,c\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] -1/(b^2*c*asin(c*x) + a*b*c)
```

3.414 $\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=47

$$-\frac{1}{bcx(a+b\text{ArcSin}(cx))}-\frac{\text{Int}\left(\frac{1}{x^2(a+b\text{ArcSin}(cx))},x\right)}{bc}$$

```
[Out] -1/b/c/x/(a+b*arcsin(c*x))-Unintegrable(1/x^2/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}=0.000$, Rules used = {}

$$\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] -(1/(b*c*x*(a + b*ArcSin[c*x]))) - Defer[Int][1/(x^2*(a + b*ArcSin[c*x])),
x]/(b*c)
```

Rubi steps

$$\int \frac{1}{x\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bcx\left(a+b\sin^{-1}(cx)\right)}-\frac{\int \frac{1}{x^2\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A]
time = 5.21, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a+b\arcsin\left(cx\right)\right)^2\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -((b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)*integrate(
1/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) +
1)/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^2*x^3 - a^2*x + (b^2*c^2*x^3 - b^2*x)*a
rcsin(c*x)^2 + 2*(a*b*c^2*x^3 - a*b*x)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x\,(a+b\,\mathrm{asin}\,(c\,x))^2\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.415 $\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=47

$$-\frac{1}{bcx^2(a+b\text{ArcSin}(cx))}-\frac{2\text{Int}\left(\frac{1}{x^3(a+b\text{ArcSin}(cx))},x\right)}{bc}$$

```
[Out] -1/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable(1/x^3/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][1/(x^3*(a + b*ArcSin[c*x
])), x])/(b*c)
```

Rubi steps

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bcx^2\left(a+b\sin^{-1}(cx)\right)}-\frac{2\int \frac{1}{x^3\left(a+b\sin^{-1}(cx)\right)}\,dx}{bc}$$

Mathematica [A]
time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a+b\arcsin\left(cx\right)\right)^2\sqrt{-c^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima
")
```

```
[Out] -(2*(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)*inte
grate(1/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3),
 x) + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^2*x^4 - a^2*x^2 + (b^2*c^2*x^4 - b^2*x^
2)*arcsin(c*x)^2 + 2*(a*b*c^2*x^4 - a*b*x^2)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x**2*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{1-c^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.416 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)))*integrate(((c^2*m - 2*c^2)*x^2 - m)*x^m/(a*b*c^5*x^5 - 2*a*
b*c^3*x^3 + a*b*c*x + (b^2*c^5*x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))), x) - x^m)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x
^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.417 $\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\mathrm{Int}\left(\frac{x^3}{(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{x^3}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 42.76, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.70, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (x^3 - (a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)))*integrate((c^2*x^4 - 3*x^2)/(a*b*c^5*x^4 - 2*a*b*c^3*x
^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))), x))/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^3}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
```

```
[Out] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.418 $\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=69

$$-\frac{x^2}{bc\left(1-c^2x^2\right)\left(a+b\text{ArcSin}(cx)\right)}+\frac{2\text{Int}\left(\frac{x}{(1-c^2x^2)^2(a+b\text{ArcSin}(cx))},x\right)}{bc}$$

```
[Out] -x^2/b/c/(-c^2*x^2+1)/(a+b*arcsin(c*x))+2*Unintegrable(x/(-c^2*x^2+1)^2/(a+
b*arcsin(c*x)),x)/b/c
```

Rubi [A]
time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\text{ArcSin}(cx)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^2/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*Defer[Int][x/((1 - c^2*
x^2)^2*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{x^2}{bc\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}+\frac{2\int \frac{x}{(1-c^2x^2)^2(a+b\sin^{-1}(cx))}\,dx}{bc}$$

Mathematica [A]
time = 6.22, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(1-c^2x^2\right)^{3/2}\left(a+b\text{ArcSin}(cx)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{3}{2}} \left(a+b \arcsin \left(cx\right)\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (x^2 + 2*(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)))*integrate(x/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (
b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))), x))/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}} \left(a+b \operatorname{asin}\left(cx\right)\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.419 $\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{x}{(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 41.59, size = 0, normalized size = 0.00

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)))*integrate((c^2*x^2 + 1)/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c
 + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x) + x)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4 -
 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^2
+ a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
```

```
[Out] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.420 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=64

$$-\frac{1}{bc\,(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}+\frac{2c\text{Int}\left(\frac{x}{(1-c^2x^2)^2(a+b\text{ArcSin}(cx))},x\right)}{b}$$

[Out] -1/b/c/(-c^2*x^2+1)/(a+b*arcsin(c*x))+2*c*Unintegrable(x/(-c^2*x^2+1)^2/(a+b*arcsin(c*x)),x)/b

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Int[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]

[Out] -(1/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*c*Defer[Int][x/((1 - c^2*x^2)^2*(a + b*ArcSin[c*x])), x])/b

Rubi steps

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx=-\frac{1}{bc\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}+\frac{(2c)\int\frac{x}{(1-c^2x^2)^2(a+b\sin^{-1}(cx))}\,dx}{b}$$

Mathematica [A]
time = 1.84, size = 0, normalized size = 0.00

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]

Maple [A]
time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (2*(a*b*c^4*x^2 - a*b*c^2 + (b^2*c^4*x^2 - b^2*c^2)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)))*integrate(x/(a*b*c^4*x^4 - 2*a*b*c^2*x^2 + a*b + (b^2*
c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))),
 x) + 1)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4 - 2
*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 +
a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{(a+b\,\mathrm{asin}\left(c\,x\right))^2\,\left(1-c^2\,x^2\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
```

```
[Out] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.421 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\text{ArcSin}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\text{ArcSin}(cx)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 34.10, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}\left(a+b\text{ArcSin}(cx)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 2.75, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((a*b*c^3*x^3 - a*b*c*x + (b^2*c^3*x^3 - b^2*c*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)))*integrate((3*c^2*x^2 - 1)/(a*b*c^5*x^6 - 2*a*b*c^3*x^4 +
 a*b*c*x^2 + (b^2*c^5*x^6 - 2*b^2*c^3*x^4 + b^2*c*x^2)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^3*x^3 - a*b*c*x + (b^2*c^3*x^3 - b^
2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^5 - 2*a^2*c^2*x^3 + a^2*x + (b^2*c^4
*x^5 - 2*b^2*c^2*x^3 + b^2*x)*arcsin(c*x)^2 + 2*(a*b*c^4*x^5 - 2*a*b*c^2*x^
3 + a*b*x)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
```

```
[Out] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.422 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 23.02, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.90, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] ((a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^3*x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)))*integrate(2*(2*c^2*x^2 - 1)/(a*b*c^5*x^7 - 2*a*b*c^3
*x^5 + a*b*c*x^3 + (b^2*c^5*x^7 - 2*b^2*c^3*x^5 + b^2*c*x^3)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^3*
x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^6 - 2*a^2*c^2*x^4 + a^2*x^2 + (b^2*c
^4*x^6 - 2*b^2*c^2*x^4 + b^2*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*x^6 - 2*a*b*c^
2*x^4 + a*b*x^2)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2}\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.423 $\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^m}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 1.28, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}}(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*
c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(((c^2*m - 4*c^2)*x
^2 - m)*x^m/(a*b*c^7*x^7 - 3*a*b*c^5*x^5 + 3*a*b*c^3*x^3 - a*b*c*x + (b^2*c
^7*x^7 - 3*b^2*c^5*x^5 + 3*b^2*c^3*x^3 - b^2*c*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))), x) - x^m)/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c
^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.424 $\int \frac{x^3}{(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\mathrm{Int}\left(\frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\mathrm{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx=\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 71.78, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\mathrm{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 3.31, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(x^3 + (a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2
 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((c^2*x^4 +
3*x^2)/(a*b*c^7*x^6 - 3*a*b*c^5*x^4 + 3*a*b*c^3*x^2 - a*b*c + (b^2*c^7*x^6
- 3*b^2*c^5*x^4 + 3*b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x))/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*
c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^3}{(a + b\,\mathrm{asin}\,(c\,x))^2\,(1 - c^2\,x^2)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
```

```
[Out] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.425 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\textbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{x^2}{(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 8.77, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 2.97, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(-c^2x^2+1)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(x^2 + (a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2
 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(2*(c^2*x^3
+ x)/(a*b*c^7*x^6 - 3*a*b*c^5*x^4 + 3*a*b*c^3*x^2 - a*b*c + (b^2*c^7*x^6 -
3*b^2*c^5*x^4 + 3*b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1))), x))/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^
3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.426 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 73.04, size = 0, normalized size = 0.00

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 2.17, size = 0, normalized size = 0.00

$$\int \frac{x}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2
*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((3*c^2*x^2 + 1)/(
a*b*c^7*x^6 - 3*a*b*c^5*x^4 + 3*a*b*c^3*x^2 - a*b*c + (b^2*c^7*x^6 - 3*b^2*
c^5*x^4 + 3*b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
), x) + x)/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*
x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x^2
 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2
+ 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
```

```
[Out] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.427 $\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=64

$$-\frac{1}{bc\left(1-c^2x^2\right)^2\left(a+b\text{ArcSin}(cx)\right)}+\frac{4c\text{Int}\left(\frac{x}{(1-c^2x^2)^3(a+b\text{ArcSin}(cx))},x\right)}{b}$$

[Out] -1/b/c/(-c^2*x^2+1)^2/(a+b*arcsin(c*x))+4*c*Unintegrable(x/(-c^2*x^2+1)^3/(a+b*arcsin(c*x)),x)/b

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Int[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]

[Out] -(1/(b*c*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))) + (4*c*Defer[Int][x/((1 - c^2*x^2)^3*(a + b*ArcSin[c*x])), x])/b

Rubi steps

$$\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx=-\frac{1}{bc\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)}+\frac{(4c)\int\frac{x}{(1-c^2x^2)^3(a+b\sin^{-1}(cx))}\,dx}{b}$$

Mathematica [A]
time = 2.94, size = 0, normalized size = 0.00

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]

Maple [A]
time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-c^{2}x^{2}+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(4*(a*b*c^6*x^4 - 2*a*b*c^4*x^2 + a*b*c^2 + (b^2*c^6*x^4 - 2*b^2*c^4*x^2 +
 b^2*c^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(x/(a*b*c^6*
x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 +
3*b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x) + 1)/(
a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x^2 +
 (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 +
2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.428 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\mathrm{Int}\left(\frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\mathrm{ArcSin}(cx)\right)^2},x\right)$$

```
[Out] Unintegrable(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\mathrm{ArcSin}(cx)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 55.71, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\mathrm{ArcSin}(cx)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 5.84, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((a*b*c^5*x^5 - 2*a*b*c^3*x^3 + a*b*c*x + (b^2*c^5*x^5 - 2*b^2*c^3*x^3 + b
^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((5*c^2*x^2 -
1)/(a*b*c^7*x^8 - 3*a*b*c^5*x^6 + 3*a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^7*x^8
- 3*b^2*c^5*x^6 + 3*b^2*c^3*x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))), x) + 1)/(a*b*c^5*x^5 - 2*a*b*c^3*x^3 + a*b*c*x + (b^2*c^5*x^
5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^7 - 3*a^2*c^4*x^5 + 3*a^2*c^2*x^3 -
 a^2*x + (b^2*c^6*x^7 - 3*b^2*c^4*x^5 + 3*b^2*c^2*x^3 - b^2*x)*arcsin(c*x)^
2 + 2*(a*b*c^6*x^7 - 3*a*b*c^4*x^5 + 3*a*b*c^2*x^3 - a*b*x)*arcsin(c*x)), x
)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
```

```
[Out] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.429 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{1}{x^2\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 16.92, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(1-c^2x^2\right)^{5/2}(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 6.04, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -((a*b*c^5*x^6 - 2*a*b*c^3*x^4 + a*b*c*x^2 + (b^2*c^5*x^6 - 2*b^2*c^3*x^4 +
 b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(2*(3*c^2*
x^2 - 1)/(a*b*c^7*x^9 - 3*a*b*c^5*x^7 + 3*a*b*c^3*x^5 - a*b*c*x^3 + (b^2*c^
7*x^9 - 3*b^2*c^5*x^7 + 3*b^2*c^3*x^5 - b^2*c*x^3)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^5*x^6 - 2*a*b*c^3*x^4 + a*b*c*x^2 + (b^
2*c^5*x^6 - 2*b^2*c^3*x^4 + b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^8 - 3*a^2*c^4*x^6 + 3*a^2*c^2*x^4 -
 a^2*x^2 + (b^2*c^6*x^8 - 3*b^2*c^4*x^6 + 3*b^2*c^2*x^4 - b^2*x^2)*arcsin(c
*x)^2 + 2*(a*b*c^6*x^8 - 3*a*b*c^4*x^6 + 3*a*b*c^2*x^4 - a*b*x^2)*arcsin(c*
x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2}\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.430 $\int \frac{1}{\sqrt{1-a^2x^2}\,\mathbf{ArcSin}(ax)^3}\,dx$

Optimal. Leaf size=13

$$-\frac{1}{2a\text{ArcSin}(ax)^2}$$

```
[Out] -1/2/a/arcsin(a*x)^2
```

Rubi [A]
time = 0.02, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {4737}

$$-\frac{1}{2a\text{ArcSin}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3),x]
```

```
[Out] -1/2*1/(a*ArcSin[a*x]^2)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{1-a^2x^2}\sin^{-1}(ax)^3}\,dx = -\frac{1}{2a\sin^{-1}(ax)^2}$$

Mathematica [A]
time = 0.01, size = 13, normalized size = 1.00

$$-\frac{1}{2a\text{ArcSin}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3),x]
```

```
[Out] -1/2*1/(a*ArcSin[a*x]^2)
```

Maple [A]
time = 0.10, size = 12, normalized size = 0.92

method	result	size
derivativedivides	$-\frac{1}{2a\arcsin(ax)^2}$	12
default	$-\frac{1}{2a\arcsin(ax)^2}$	12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/2/a/arcsin(a*x)^2
```

Maxima [A]
time = 0.47, size = 11, normalized size = 0.85

$$-\frac{1}{2\,a\arcsin\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] -1/2/(a*arcsin(a*x)^2)
```

Fricas [A]
time = 1.65, size = 11, normalized size = 0.85

$$-\frac{1}{2\,a\arcsin\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] -1/2/(a*arcsin(a*x)^2)
```

Sympy [A]
time = 0.40, size = 12, normalized size = 0.92

$$-\frac{1}{2a\operatorname{asin}^2\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
[Out] -1/(2*a*asin(a*x)**2)
```

Giac [A]
time = 0.45, size = 11, normalized size = 0.85

$$-\frac{1}{2\,a \arcsin\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2/(a*arcsin(a*x)^2)
```

Mupad [B]
time = 0.12, size = 11, normalized size = 0.85

$$-\frac{1}{2\,a\,\mathrm{asin}\left(a\,x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^3*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] -1/(2*a*asin(a*x)^2)
```

3.431 $\int \frac{x^3(d-c^2dx^2)}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=251

$$-\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{d\sqrt{3\pi}\,\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3d\sqrt{\pi}\,\cos\left(\frac{2a}{b}\right)\text{FresnelC}}{8b^{3}}$$

```
[Out] 3/8*d*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1
/2)/b^(3/2)/c^4+3/8*d*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*
sin(2*a/b)*Pi^(1/2)/b^(3/2)/c^4-1/8*d*cos(6*a/b)*FresnelC(2*3^(1/2)/Pi^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*3^(1/2)*Pi^(1/2)/b^(3/2)/c^4-1/8*d*Fresn
elS(2*3^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(6*a/b)*3^(1/2)*
Pi^(1/2)/b^(3/2)/c^4-2*d*x^3*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A]
time = 0.86, antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$-\frac{\sqrt{3\pi}\,d\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3\sqrt{\pi}\,d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3\sqrt{\pi}\,d\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^4}-\frac{\sqrt{3\pi}\,d\sin\left(\frac{6a}{b}\right)S\left(\frac{2\sqrt{\frac{3}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}-\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*x^3*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (d*Sqrt[3*Pi
]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8
*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*
x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*FresnelS[(2*Sqrt[
a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(8*b^(3/2)*c^4) - (d*
Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*
a)/b])/(8*b^(3/2)*c^4)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
```

```
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{(6d)\int \frac{x^2\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc}-\frac{(12cd)\int \frac{x^4\sqrt{1-c^2}}{\sqrt{a+b\sin^{-}}}}{b}$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{(6d)\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{bc^4}-\frac{(12d)\text{S}}{}$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{(6d)\text{Subst}\left(\int \left(\frac{1}{8\sqrt{a+bx}}-\frac{\cos(4x)}{8\sqrt{a+bx}}\right)dx,x,\sin^{-}\right.}{bc^4}$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{(3d)\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{8bc^4}-\frac{(3d)\text{Sub}}{}$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{\left(3d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{8bc^4}-$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}+\frac{\left(3d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\sin^{-1}}\right.}{4b^2c^4}$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{d\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)C\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}+\frac{3d}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.98, size = 287, normalized size = 1.14

$$-\frac{ide^{-\frac{6ia}{b}}\left(3\sqrt{2}e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)-3\sqrt{2}e^{\frac{8ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)-\sqrt{6}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{6i(a+b\text{ArcSin}(cx))}{b}\right)+\sqrt{6}e^{\frac{12ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{6i(a+b\text{ArcSin}(cx))}{b}\right)-6ie^{\frac{6ia}{b}}\sin(2\text{ArcSin}(cx))+2ie^{\frac{6ia}{b}}\sin(6\text{ArcSin}(cx))\right)}{32bc^4\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
[Out] ((-1/32*I)*d*(3*Sqrt[2]*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*
Gamma[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[2]*E^(((8*I)*a)/b)*Sqrt
```

```
[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - Sqr
t[6]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6*I)*(a + b*ArcSin[c*
x]))/b] + Sqrt[6]*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/
2, ((6*I)*(a + b*ArcSin[c*x]))/b] - (6*I)*E^(((6*I)*a)/b)*Sin[2*ArcSin[c*x]
] + (2*I)*E^(((6*I)*a)/b)*Sin[6*ArcSin[c*x]]))/(b*c^4*E^(((6*I)*a)/b)*Sqrt[
a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.37, size = 308, normalized size = 1.23

method	result
default	$-\frac{d\left(\sqrt{-\frac{6}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}\,\mathrm{FresnelC}\left(\frac{6\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{6}{b}}\,b}\right)\cos\left(\frac{6a}{b}\right)-\sqrt{-\frac{6}{b}}\,\sqrt{\pi}\,\sqrt{2}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/c^4*d/b*((-6/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*Fresne
lC(6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*cos(6*a/b)-(-
6/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*FresnelS(6*2^(1/2)/Pi^(
1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*sin(6*a/b)-3*(a+b*arcsin(c*x))
^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b)*(-2/b)^(1/2)*Pi^(1/2)*2^(1/2)+3*(a+b*arcsin(c*x))^(1/2)*sin(2*a/
b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-2/
b)^(1/2)*Pi^(1/2)*2^(1/2)-3*sin(-2*(a+b*arcsin(c*x))/b+2*a/b)+sin(-6*(a+b*a
rcsin(c*x))/b+6*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{x^3}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx+\int\frac{c^2x^5}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(
c*x)), x) + Integral(c**2*x**5/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin
(c*x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(d-c^2\,d\,x^2\right)}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2),x)
```

```
[Out] int((x^3*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2), x)
```

3.432 $\int \frac{x^2(d-c^2dx^2)}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=591

$$-\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{5d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3}+\frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{A}}}{\sqrt{b}}\right.}{b^{3/2}c^3}$$

```
[Out] 1/8*d*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))
*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3-1/8*d*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3-1/4*d*cos(a/b)*
FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)
/b^(3/2)/c^3+1/4*d*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/8*d*cos(5*a/b)*FresnelS(10^(1/2)
/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*10^(1/2)*Pi^(1/2)/b^(3/2)/c^3-1/
8*d*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/b)*
10^(1/2)*Pi^(1/2)/b^(3/2)/c^3-2*d*x^2*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*
x))^(1/2)
```

Rubi [A]
time = 1.06, antiderivative size = 591, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$-\frac{\sqrt{2\pi}\,d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}+\frac{5\sqrt{\frac{\pi}{2}}\,d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3}-\frac{\sqrt{\frac{2\pi}{3}}\,d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}+\frac{5\sqrt{\frac{\pi}{6}}\,d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3}-\frac{\sqrt{\frac{5\pi}{2}}\,d\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3}+\frac{\sqrt{2\pi}\,d\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{5\sqrt{\frac{\pi}{2}}\,d\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3}+\frac{\sqrt{\frac{2\pi}{3}}\,d\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{5\sqrt{\frac{\pi}{6}}\,d\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3}+\frac{\sqrt{\frac{5\pi}{2}}\,d\cos\left(\frac{5a}{b}\right)S\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3}-\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*x^2*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (5*d*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt
[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (d*Sqrt[(2*Pi)/
3]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^
(3/2)*c^3) + (d*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (5*d*Sqrt[Pi/2]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*b^(3/2)*c^3) - (d*Sqrt
[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^
(3/2)*c^3) + (5*d*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/
Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c^3) - (d*Sqrt[(2*Pi)/3]*FresnelC[(Sqrt[6
/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c^3) - (d*Sqr
```

```
t[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*
a)/b])/(4*b^(3/2)*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
```

```
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2(d-c^2dx^2)}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(4d)\int \frac{x\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(10cd)\int \frac{x^3\sqrt{1-c^2 \ldots}}{\sqrt{a+b\sin^{-1} \ldots}}}{b}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(4d)\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \frac{(10d)\text{Su}\ldots}{}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(4d)\text{Subst}\left(\int \left(\frac{\sin(x)}{4\sqrt{a+bx}} + \frac{\sin(3x)}{4\sqrt{a+bx}}\right)\,dx, x, \sin^{-} \ldots\right.}{bc^3}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(5d)\text{Subst}\left(\int \frac{\sin(3x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc^3} + \frac{(5d)\text{Sub}\ldots}{}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \ldots$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(c \ldots}\right.}{b^2c^3}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{5d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3} + \frac{d\sqrt{2}\ldots}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 1.02, size = 514, normalized size = 0.87

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d*(E^(((5*I)*a)/b) + E^(((5*I)*a)/b + (2*I)*ArcSin[c*x]) - 2*E^(((5*I)*a)/
b + (4*I)*ArcSin[c*x]) - 2*E^(((5*I)*a)/b + (6*I)*ArcSin[c*x]) + E^(((5*I)*
```

```
a)/b + (8*I)*ArcSin[c*x]) + E^(((5*I)*(a + 2*b*ArcSin[c*x]))/b) + 2*E^(((4*
I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
((-I)*(a + b*ArcSin[c*x]))/b] + 2*E^(((6*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[
(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*
E^(((2*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*E^(((8*I)*a)/b + (5*I)*Arc
Sin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c
*x]))/b] - Sqrt[5]*E^((5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]
*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[5]*E^(((5*I)*(2*a + b*Ar
cSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((5*I)*(a + b*Arc
Sin[c*x]))/b]))/(16*b*c^3*E^(((5*I)*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcS
in[c*x]])
```

Maple [A]
time = 0.36, size = 447, normalized size = 0.76

method	result
default	$-\frac{d\left(\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{5}{b}}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{5a}{b}\right)\mathrm{S}\left(\frac{5\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{5}{b}}\,b}\right)+\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{5}{b}}\,\sqrt{a-}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c^3*d/b*(2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(5*a
/b)*FresnelS(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+2^(
1/2)*Pi^(1/2)*(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(5*a/b)*FresnelC(5*2^
(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-2*(a+b*arcsin(c*x))^
(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/
2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-2*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*Fres
nelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*
Pi^(1/2)*2^(1/2)+(a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(
1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)+
(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)
*(a+b*arcsin(c*x))^(1/2)/b)*(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)+2*cos(-(a+b*arcsi
n(c*x))/b+a/b)-cos(-3*(a+b*arcsin(c*x))/b+3*a/b)-cos(-5*(a+b*arcsin(c*x))/b
+5*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] -integrate((c^2*d*x^2 - d)*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{x^2}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx+\int\frac{c^2x^4}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
[Out] -d*(Integral(-x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(
c*x)), x) + Integral(c**2*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin
(c*x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^2\left(d-c^2\,d\,x^2\right)}{{\left(a+b\operatorname{asin}\left(c\,x\right)\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2),x)
[Out] int((x^2*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2), x)
```

3.433 $\int \frac{x(d-c^2dx^2)}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=241

$$-\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}+\frac{d\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\right.}{b^{3/2}c}$$

```
[Out] 1/2*d*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+1/2*d*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arcs
in(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+d*cos(2*a/b
)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(3/2)/c^2
+d*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)
/b^(3/2)/c^2-2*d*x*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A]
time = 0.45, antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4799, 4753, 3393, 3387, 3386, 3432, 3385, 3433, 4809, 4491}

$$\frac{\sqrt{\frac{\pi}{2}}\,d\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{\pi}\,d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{\pi}\,d\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}c^2}+\frac{\sqrt{\frac{\pi}{2}}\,d\sin\left(\frac{4a}{b}\right)S\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}-\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*x*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d*Sqrt[Pi/2]*
Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(
3/2)*c^2) + (d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(
Sqrt[b]*Sqrt[Pi])])/(b^(3/2)*c^2) + (d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(b^(3/2)*c^2) + (d*Sqrt[Pi/2]*F
resnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3
/2)*c^2)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
```

```
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
```

```
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x(d-c^2dx^2)}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d)\int \frac{\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(8cd)\int \frac{x^2\sqrt{1-c^2}}{\sqrt{a+b\sin^{-1}}}}{b}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d)\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{(8d)\text{Sub}}{}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d)\text{Subst}\left(\int \left(\frac{1}{2\sqrt{a+bx}} + \frac{\cos(2x)}{2\sqrt{a+bx}}\right)\,dx, x, \sin^{-}\right.}{bc^2}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} + \frac{d\text{Subst}\left(\int\right.}{}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} +$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(2d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}}\right.}{b^2c^2}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{d\sqrt{}}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 1.49, size = 375, normalized size = 1.56

$$\frac{d\left(8\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{1}{b}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{\pi}}\right)+8\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}S\left(\frac{2\sqrt{\frac{1}{b}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)+\frac{ie^{-\frac{4ia}{b}}\left(\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)-\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{1}{2},\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)-\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{1}{2},-\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{8ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{1}{2},\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)+2ie^{\frac{4ia}{b}}\sin(2\text{ArcSin}(cx))+ie^{\frac{4ia}{b}}\sin(4\text{ArcSin}(cx))\right)}{b\sqrt{a+b\text{ArcSin}(cx)}}\right)}{4c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d*(8*(b^(-1))^(3/2)*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[b^(-1)]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[Pi]] + 8*(b^(-1))^(3/2)*Sqrt[Pi]*FresnelS[(2*Sqrt[b^
```

```
(-1)]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[Pi]]*Sin[(2*a)/b] + (I*(Sqrt[2]*E^(((2*
I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-2*I)*(a + b*ArcSi
n[c*x]))/b] - Sqrt[2]*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma
[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*G
amma[1/2, ((-4*I)*(a + b*ArcSin[c*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*
ArcSin[c*x]))/b]*Gamma[1/2, ((4*I)*(a + b*ArcSin[c*x]))/b] + (2*I)*E^(((4*I
)*a)/b)*Sin[2*ArcSin[c*x]] + I*E^(((4*I)*a)/b)*Sin[4*ArcSin[c*x]]))/(b*E^((
(4*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])))/(4*c^2)
```

Maple [A]
time = 0.23, size = 311, normalized size = 1.29

method	result
default	$-\frac{d\left(2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}\,\sin\left(\frac{4a}{b}\right)\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c^2*d/b*(2*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(4
*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-2
*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*FresnelC(2*2^(1/2)/P
i^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*cos(4*a/b)-2*(a+b*arcsin(c*
x))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b)*(-2/b)^(1/2)*Pi^(1/2)*2^(1/2)+2*(a+b*arcsin(c*x))^(1/2)*sin(2
*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(
-2/b)^(1/2)*Pi^(1/2)*2^(1/2)-sin(-4*(a+b*arcsin(c*x))/b+4*a/b)-2*sin(-2*(a+
b*arcsin(c*x))/b+2*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int\left(-\frac{x}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx+\int\frac{c^2x^3}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(c*x
)), x) + Integral(c**2*x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x\,\left(d-c^2\,d\,x^2\right)}{{\left(a+b\,\operatorname{asin}\left(c\,x\right)\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2),x)
```

```
[Out] int((x*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2), x)
```

3.434 $\int \frac{d-c^2dx^2}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=253

$$-\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{3d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{d\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b}}{\sqrt{}}\right.}{b^{3/2}c}$$

```
[Out] -3/2*d*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*
2^(1/2)*Pi^(1/2)/b^(3/2)/c+3/2*d*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c-1/2*d*cos(3*a/b)*Fresn
elS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/b^(3
/2)/c+1/2*d*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(
3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c-2*d*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*
x))^(1/2)
```

Rubi [A]
time = 0.36, antiderivative size = 253, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4751, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\frac{3\sqrt{\frac{\pi}{2}}\,d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}+\frac{\sqrt{\frac{3\pi}{2}}\,d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{3\sqrt{\frac{\pi}{2}}\,d\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{\sqrt{\frac{3\pi}{2}}\,d\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (3*d*Sqrt[Pi/2]*
Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c
) - (d*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c) + (3*d*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) + (d*Sqrt[(3*Pi)/2]*Fresnel
C[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
```

```
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{d-c^2dx^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(6cd)\int \frac{x\sqrt{1-c^2x^2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(6d)\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(6d)\text{Subst}\left(\int \left(\frac{\sin(x)}{4\sqrt{a+bx}} + \frac{\sin(3x)}{4\sqrt{a+bx}}\right)\,dx, x, \sin^{-1}(\cdots}{bc}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(3d)\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2bc} - \frac{(3d)\text{Subst}\cdots}{\cdots}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2bc} - \cdots$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(cx\cdots}\right.}{b^2c}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{3d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{d\sqrt{\frac{3\cdots}{2\cdots}}\cdots}{\cdots}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.64, size = 348, normalized size = 1.38

$$\frac{de^{-\frac{3i(a+b\text{ArcSin}(cx))}{b}}\left(-e^{\frac{3ia}{b}}-3e^{\frac{3ia}{b}+2i\text{ArcSin}(cx)}-3e^{\frac{3ia}{b}+4i\text{ArcSin}(cx)}-e^{\frac{3i(a+2b\text{ArcSin}(cx))}{b}}+3e^{\frac{2ia}{b}+3i\text{ArcSin}(cx)}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+3e^{\frac{4ia}{b}+3i\text{ArcSin}(cx)}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+\sqrt{3}e^{3i\text{ArcSin}(cx)}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)+\sqrt{3}e^{3i\left(\frac{2a}{b}+\text{ArcSin}(cx)\right)}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)\right)}{4bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d*(-E^(((3*I)*a)/b) - 3*E^(((3*I)*a)/b + (2*I)*ArcSin[c*x]) - 3*E^(((3*I)*
a)/b + (4*I)*ArcSin[c*x]) - E^(((3*I)*(a + 2*b*ArcSin[c*x]))/b) + 3*E^(((2*
```

```
I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
((-I)*(a + b*ArcSin[c*x]))/b] + 3*E^(((4*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[
(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] + Sqrt[3]*
E^((3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)
*(a + b*ArcSin[c*x]))/b] + Sqrt[3]*E^((3*I)*((2*a)/b + ArcSin[c*x]))*Sqrt[(
I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b]))/(4*b*
c*E^(((3*I)*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.23, size = 304, normalized size = 1.20

method	result
default	$-\frac{d\left(-3\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\mathrm{S}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-3\sqrt{a+b\arcsin(cx)}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/c*d/b/(a+b*arcsin(c*x))^(1/2)*(-3*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*Fre
snelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)
*Pi^(1/2)*2^(1/2)-3*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-(
a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*
(a+b*arcsin(c*x))^(1/2)/b)*(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)-(a+b*arcsin(c*x))^
(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))
^(1/2)/b)*(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)+3*cos(-(a+b*arcsin(c*x))/b+a/b)+cos
(-3*(a+b*arcsin(c*x))/b+3*a/b))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int \frac{c^2x^2}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\int\left(-\frac{1}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(c**2*x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*a
sin(c*x)), x) + Integral(-1/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{d-c^2\,d\,x^2}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d - c^2*d*x^2)/(a + b*asin(c*x))^(3/2),x)
```

```
[Out] int((d - c^2*d*x^2)/(a + b*asin(c*x))^(3/2), x)
```

3.435 $\int \frac{d-c^2dx^2}{x(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=171

$$-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\text{ArcSin}(cx)}}-\frac{2d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}}-\frac{2d\sqrt{\pi}\,S\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}\sqrt{\pi}}\right.}{b^{3/2}}$$

```
[Out] -2*d*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/
2)/b^(3/2)-2*d*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a
/b)*Pi^(1/2)/b^(3/2)-2*d*(-c^2*x^2+1)^(3/2)/b/c/x/(a+b*arcsin(c*x))^(1/2)-2
*d*Unintegrable(1/x^2/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^(1/2),x)/b/c
```

Rubi [A]
time = 0.48, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{d-c^2dx^2}{x(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (2*d*Sqrt[Pi]*
Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/b^(3
/2) - (2*d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])
]*Sin[(2*a)/b])/b^(3/2) - (2*d*Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a +
 b*ArcSin[c*x]]), x])/(b*c)
```

Rubi steps

$$\int \frac{d-c^2dx^2}{x\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx=-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}}-\frac{(2d)\int \frac{\sqrt{1-c^2x^2}}{x^2\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc}-\frac{(4cd)\int \frac{\sqrt{1-}}{\sqrt{a+b\sin}}}{b}$$

$$=-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}}-\frac{(4d)\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{b}-\frac{(2d)\int}{}$$

$$=-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}}-\frac{(4d)\text{Subst}\left(\int \left(\frac{1}{2\sqrt{a+bx}}+\frac{\cos(2x)}{2\sqrt{a+bx}}\right)dx,x,\sin\right.}{b}$$

$$=-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}}-\frac{(2d)\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{b}-\frac{(2d)\int}{}$$

$$=-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}}-\frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc}-\frac{(2d\,\text{co}}{}$$

$$=-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}}-\frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc}-\frac{(4d\,\text{co}}{}$$

$$=-\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}}-\frac{2d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)C\left(\frac{2\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}}-\frac{2d\sqrt{\pi}}{}$$

Mathematica [A]
time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{d-c^2dx^2}{x(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Integrate[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A]
time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{-c^{2} d \,x^{2}+d}{x \left(a +b \arcsin \left(c x \right)\right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-d\left(\int \frac{c^{2}x^{2}}{ax\sqrt{a+b\operatorname{asin}(cx)}+bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\int\left(-\frac{1}{ax\sqrt{a+b\operatorname{asin}(cx)}+bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)/x/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(c**2*x**2/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b*asin(c*x
))*asin(c*x)), x) + Integral(-1/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b
*asin(c*x))*asin(c*x)), x))
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{d-c^2\,d\,x^2}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d - c^2*d*x^2)/(x*(a + b*asin(c*x))^(3/2)),x)
```

```
[Out] int((d - c^2*d*x^2)/(x*(a + b*asin(c*x))^(3/2)), x)
```

3.436 $\int \frac{x^3(d-c^2dx^2)^2}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=485

$$-\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}+\frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}-\frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\text{Fresne}}{}$$

```
[Out] 1/16*d^2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(
1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^4+1/16*d^2*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+
b*arcsin(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^4+3/16*
d^2*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2
)/b^(3/2)/c^4-1/16*d^2*cos(8*a/b)*FresnelC(4*(a+b*arcsin(c*x))^(1/2)/b^(1/2
)/Pi^(1/2))*Pi^(1/2)/b^(3/2)/c^4+3/16*d^2*FresnelS(2*(a+b*arcsin(c*x))^(1/2
)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/b^(3/2)/c^4-1/16*d^2*FresnelS(4*(a+
b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(8*a/b)*Pi^(1/2)/b^(3/2)/c^4-1/16
*d^2*cos(6*a/b)*FresnelC(2*3^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*3^(1/2)*Pi^(1/2)/b^(3/2)/c^4-1/16*d^2*FresnelS(2*3^(1/2)/Pi^(1/2)*(a+b*ar
csin(c*x))^(1/2)/b^(1/2))*sin(6*a/b)*3^(1/2)*Pi^(1/2)/b^(3/2)/c^4-2*d^2*x^3
*(-c^2*x^2+1)^(5/2)/b/c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A]
time = 1.01, antiderivative size = 485, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}-\frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4}+\frac{3\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{16b^{3/2}c^4}-\frac{\sqrt{\pi}d^2\cos\left(\frac{8a}{b}\right)\text{FresnelC}\left(\frac{4\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{16b^{3/2}c^4}+\frac{3\sqrt{\pi}d^2\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}+\frac{\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{4a}{b}\right)S\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}-\frac{\sqrt{3\pi}d^2\sin\left(\frac{6a}{b}\right)S\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4}-\frac{\sqrt{\pi}d^2\sin\left(\frac{8a}{b}\right)S\left(\frac{4\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}-\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*x^3*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[
Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqr
t[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*Cos[(2*a
)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(16*b^(3/2)*
c^4) - (d^2*Sqrt[Pi]*Cos[(8*a)/b]*FresnelC[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqr
t[b]*Sqrt[Pi])])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*
ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(16*b^(3/2)*c^4) + (d^2*Sqr
t[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/
b])/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*Arc
```

```
Sin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(16*b^(3/2)*c^4) - (d^2*Sqrt[Pi]*FresnelS
[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(8*a)/b])/(16*b^(3/2)*
c^4)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
```

```
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(6d^2)\int \frac{x^2(1-c^2x^2)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(16cd^2)\int \frac{x^4(1-c^2x^2}{\sqrt{a+b\sin}}}{b}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(6d^2)\,\mathrm{Subst}\left(\int \frac{\cos^4(x)\sin^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^4} - \frac{(16d^2)}{}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(6d^2)\,\mathrm{Subst}\left(\int \left(\frac{1}{16\sqrt{a+bx}} + \frac{\cos(2x)}{32\sqrt{a+bx}} - \frac{\cos(4x)}{16\sqrt{a+}}\right.\right.}{bc^4}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\mathrm{Subst}\left(\int \frac{\cos(8x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc^4} + \frac{(3d^2)\,\mathrm{Subst}}{}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\mathrm{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{16bc^4} -$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\mathrm{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(}\right.}{8b^2c^4}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} - \frac{d^2\sqrt{}}{}$$

<u>Mathematica</u> **[C]** Result contains complex when optimal does not.
time = 1.90, size = 540, normalized size = 1.11

$$-\frac{id^2e^{-\frac{8ia}{b}}\left(3\sqrt{2}e^{\frac{6ia}{b}}\sqrt{-\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},-\frac{2i(a+b\mathrm{ArcSin}(cx))}{b}\right)-3\sqrt{2}e^{\frac{10ia}{b}}\sqrt{\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},\frac{2i(a+b\mathrm{ArcSin}(cx))}{b}\right)+2e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},-\frac{4i(a+b\mathrm{ArcSin}(cx))}{b}\right)-2e^{\frac{12ia}{b}}\sqrt{\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},\frac{4i(a+b\mathrm{ArcSin}(cx))}{b}\right)-\sqrt{6}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},-\frac{6i(a+b\mathrm{ArcSin}(cx))}{b}\right)+\sqrt{6}e^{\frac{14ia}{b}}\sqrt{\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},\frac{6i(a+b\mathrm{ArcSin}(cx))}{b}\right)-\sqrt{2}\sqrt{-\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},-\frac{8i(a+b\mathrm{ArcSin}(cx))}{b}\right)+\sqrt{2}e^{\frac{16ia}{b}}\sqrt{\frac{i(a+b\mathrm{ArcSin}(cx))}{b}}\mathrm{Gamma}\left(\frac{1}{2},\frac{8i(a+b\mathrm{ArcSin}(cx))}{b}\right)-6ie^{\frac{8ia}{b}}\sin(2\mathrm{ArcSin}(cx))-2ie^{\frac{8ia}{b}}\sin(4\mathrm{ArcSin}(cx))+2ie^{\frac{8ia}{b}}\sin(6\mathrm{ArcSin}(cx))+ie^{\frac{8ia}{b}}\sin(8\mathrm{ArcSin}(cx))\right)}{64bc^4\sqrt{a+b\mathrm{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] ((-1/64*I)*d^2*(3*Sqrt[2]*E^(((6*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b
]*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[2]*E^(((10*I)*a)/b)*S
```

```
qrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] +
2*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-4*I)*(a
+ b*ArcSin[c*x]))/b] - 2*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*G
amma[1/2, ((4*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[6]*E^(((2*I)*a)/b)*Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6*I)*(a + b*ArcSin[c*x]))/b] + Sqr
t[6]*E^(((14*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((6*I)*(a
+ b*ArcSin[c*x]))/b] - Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2
, ((-8*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[2]*E^(((16*I)*a)/b)*Sqrt[(I*(a + b
*ArcSin[c*x]))/b]*Gamma[1/2, ((8*I)*(a + b*ArcSin[c*x]))/b] - (6*I)*E^(((8*
I)*a)/b)*Sin[2*ArcSin[c*x]] - (2*I)*E^(((8*I)*a)/b)*Sin[4*ArcSin[c*x]] + (2
*I)*E^(((8*I)*a)/b)*Sin[6*ArcSin[c*x]] + I*E^(((8*I)*a)/b)*Sin[8*ArcSin[c*x
]]))/(b*c^4*E^(((8*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.35, size = 603, normalized size = 1.24

method	result
default	$\frac{d^2\left(4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}\,\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\cos\left(\frac{4a}{b}\right)-4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/64/c^4*d^2/b/(a+b*arcsin(c*x))^(1/2)*(4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+
b*arcsin(c*x))^(1/2)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b)*cos(4*a/b)-4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^
(1/2)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))
^(1/2)/b)+6*(a+b*arcsin(c*x))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/
(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-2/b)^(1/2)*Pi^(1/2)*2^(1/2)-6*(a+
b*arcsin(c*x))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a
+b*arcsin(c*x))^(1/2)/b)*(-2/b)^(1/2)*Pi^(1/2)*2^(1/2)-2*(-2/b)^(1/2)*Pi^(1
/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(8*a/b)*FresnelC(4*2^(1/2)/Pi^(1/2)/
(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+2*(-2/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+
b*arcsin(c*x))^(1/2)*sin(8*a/b)*FresnelS(4*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a
+b*arcsin(c*x))^(1/2)/b)-2*(-6/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^
(1/2)*FresnelC(6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c
os(6*a/b)+2*(-6/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*FresnelS(
6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*sin(6*a/b)+6*sin
(-2*(a+b*arcsin(c*x))/b+2*a/b)+2*sin(-4*(a+b*arcsin(c*x))/b+4*a/b)-2*sin(-6
*(a+b*arcsin(c*x))/b+6*a/b)-sin(-8*(a+b*arcsin(c*x))/b+8*a/b))
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima
")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas
")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^2\left(\int \frac{x^3}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\int\left(-\frac{2c^2x^5}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx+\int \frac{c^4x^7}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin
(c*x)), x) + Integral(-2*c**2*x**5/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*
asin(c*x))*asin(c*x)), x) + Integral(c**4*x**7/(a*sqrt(a + b*asin(c*x)) + b
*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(d-c^2\,d\,x^2\right)^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2),x)
[Out] int((x^3*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2), x)
```

3.437 $\int \frac{x^2\left(d-c^2dx^2\right)^2}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=511

$$-\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{5d^2\sqrt{\frac{\pi}{2}}\,\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}+\frac{d^2\sqrt{\frac{3\pi}{2}}\,\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\,\sqrt{a+}}{}\right.}{16b^{3/2}c^3}$$

```
[Out] -5/32*d^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+5/32*d^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arc
sin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/32*d^2*cos
(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*
Pi^(1/2)/b^(3/2)/c^3-1/32*d^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(
1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3+3/32*d^2*cos(5*a/b)*F
resnelS(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*10^(1/2)*Pi^(1/2
)/b^(3/2)/c^3-3/32*d^2*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b
^(1/2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/32*d^2*cos(7*a/b)*Fresne
lS(14^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*14^(1/2)*Pi^(1/2)/b^(
3/2)/c^3-1/32*d^2*FresnelC(14^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*sin(7*a/b)*14^(1/2)*Pi^(1/2)/b^(3/2)/c^3-2*d^2*x^2*(-c^2*x^2+1)^(5/2)/b/
c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A]
time = 1.34, antiderivative size = 511, normalized size of antiderivative = 1.00, number of steps used = 42, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\frac{5\sqrt{\frac{\pi}{2}}\,d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{\sqrt{\frac{3\pi}{2}}\,d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{3\sqrt{\frac{5\pi}{2}}\,d^2\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{\sqrt{\frac{7\pi}{2}}\,d^2\sin\left(\frac{7a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{14}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{5\sqrt{\frac{\pi}{2}}\,d^2\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}+\frac{\sqrt{\frac{3\pi}{2}}\,d^2\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}+\frac{3\sqrt{\frac{5\pi}{2}}\,d^2\cos\left(\frac{5a}{b}\right)S\left(\frac{\sqrt{\frac{10}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}+\frac{\sqrt{\frac{7\pi}{2}}\,d^2\cos\left(\frac{7a}{b}\right)S\left(\frac{\sqrt{\frac{14}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}-\frac{2d^2x^2\left(1-c^2x^2\right)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*x^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqr
t[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(1
6*b^(3/2)*c^3) + (d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (3*d^2*Sqrt[(5*Pi)/2]*Cos
[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3
/2)*c^3) + (d^2*Sqrt[(7*Pi)/2]*Cos[(7*a)/b]*FresnelS[(Sqrt[14/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (5*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(16*b^(3/2)*c^3) - (d^
2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin
```

```
[(3*a)/b])/(16*b^(3/2)*c^3) - (3*d^2*Sqrt[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*S
qrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(16*b^(3/2)*c^3) - (d^2*Sqrt
[(7*Pi)/2]*FresnelC[(Sqrt[14/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(7*a
)/b])/(16*b^(3/2)*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
```

```
1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(4d^2)\int \frac{x(1-c^2x^2)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(14cd^2)\int \frac{x^3(1-c^2 \cdots}{\sqrt{a+b\sin \cdots}}}{b}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(4d^2)\,\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^3} - \frac{(14d^2) \cdots}{\cdots}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(4d^2)\,\text{Subst}\left(\int \left(\frac{\sin(x)}{8\sqrt{a+bx}} + \frac{3\sin(3x)}{16\sqrt{a+bx}} + \frac{\sin(5x}{16\sqrt{a+ \cdots}} \cdots\right.\right.}{bc^3}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(7d^2)\,\text{Subst}\left(\int \frac{\sin(5x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{32bc^3} + \frac{(7d^2)\,\text{S} \cdots}{\cdots}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2bc^3} - \cdots$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(c \cdots}\right.}{b^2c^3}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{d^2 \cdots}{\cdots}$$

Mathematica [C] Result contains complex when optimal does not.
time = 1.89, size = 686, normalized size = 1.34

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d^2*(E^(((7*I)*a)/b) + 3*E^(((7*I)*a)/b + (2*I)*ArcSin[c*x]) + E^(((7*I)*a
)/b + (4*I)*ArcSin[c*x]) - 5*E^(((7*I)*a)/b + (6*I)*ArcSin[c*x]) - 5*E^(((7
```

*I)*a)/b + (8*I)*ArcSin[c*x]) + E^(((7*I)*a)/b + (10*I)*ArcSin[c*x]) + 3*E^
(((7*I)*a)/b + (12*I)*ArcSin[c*x]) + E^(((7*I)*(a + 2*b*ArcSin[c*x]))/b) +
5*E^(((6*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Ga
mma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 5*E^(((8*I)*a)/b + (7*I)*ArcSin[c*
x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] -
Sqrt[3]*E^(((4*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x])
)/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*E^(((10*I)*a)/b +
(7*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a +
b*ArcSin[c*x]))/b] - 3*Sqrt[5]*E^(((2*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - 3*S
qrt[5]*E^(((12*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]
*Gamma[1/2, ((5*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[7]*E^((7*I)*ArcSin[c*x])*
Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-7*I)*(a + b*ArcSin[c*x]))/
b] - Sqrt[7]*E^(((7*I)*(2*a + b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]
))/b]*Gamma[1/2, ((7*I)*(a + b*ArcSin[c*x]))/b]))/(64*b*c^3*E^(((7*I)*(a +
b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])

Maple [A]
time = 0.35, size = 594, normalized size = 1.16

method	result
default	$-\frac{d^2\left(\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{3a}{b}\right)\mathrm{S}\left(\frac{3\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{3}{b}}\,b}\right)\sqrt{-\frac{3}{b}}\,\sqrt{\pi}\,\sqrt{2}+\sqrt{a+b\arcsin(cx)}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/32/c^3*d^2/b*((a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(
1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)+
(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)
*(a+b*arcsin(c*x))^(1/2)/b)*(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)-5*(a+b*arcsin(c*x
))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-5*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*F
resnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/
2)*Pi^(1/2)*2^(1/2)+3*2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)
*cos(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)+3*2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(5*a/b)*Fre
snelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+Pi^(1/2)*2
^(1/2)*cos(7*a/b)*FresnelS(7*2^(1/2)/Pi^(1/2)/(-7/b)^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*(-7/b)^(1/2)+Pi^(1/2)*2^(1/2)*sin(7*a/b)
*FresnelC(7*2^(1/2)/Pi^(1/2)/(-7/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*a
rcsin(c*x))^(1/2)*(-7/b)^(1/2)+5*cos(-(a+b*arcsin(c*x))/b+a/b)-cos(-3*(a+b*

```
arcsin(c*x))/b+3*a/b)-3*cos(-5*(a+b*arcsin(c*x))/b+5*a/b)-cos(-7*(a+b*arcsi
n(c*x))/b+7*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima
")
[Out] integrate((c^2*d*x^2 - d)^2*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas
")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^2\left(\int\frac{x^2}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\int\left(-\frac{2c^2x^4}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx+\int\frac{c^4x^6}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
[Out] d**2*(Integral(x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin
(c*x)), x) + Integral(-2*c**2*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*
asin(c*x))*asin(c*x)), x) + Integral(c**4*x**6/(a*sqrt(a + b*asin(c*x)) + b
*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2 \left(d - c^2 d x^2\right)^2}{\left(a + b \operatorname{asin}\left(c x\right)\right)^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2),x)
[Out] int((x^2*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2), x)
```

3.438 $\int \frac{x(d-c^2dx^2)^2}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=373

$$-\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}+\frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\text{Fresne}}{}$$

```
[Out] 1/2*d^2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1
/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+1/2*d^2*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*
arcsin(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+5/8*d^2
*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b
^(3/2)/c^2+5/8*d^2*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin
(2*a/b)*Pi^(1/2)/b^(3/2)/c^2+1/8*d^2*cos(6*a/b)*FresnelC(2*3^(1/2)/Pi^(1/2)
*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*3^(1/2)*Pi^(1/2)/b^(3/2)/c^2+1/8*d^2*Fres
nelS(2*3^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(6*a/b)*3^(1/2)
*Pi^(1/2)/b^(3/2)/c^2-2*d^2*x*(-c^2*x^2+1)^(5/2)/b/c/(a+b*arcsin(c*x))^(1/2
)
```

Rubi [A]
time = 0.82, antiderivative size = 373, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.370$, Rules used = {4799, 4753, 3393, 3387, 3386, 3432, 3385, 3433, 4809, 4491}

$$\frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2}+\frac{5\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{\pi}\sqrt{b}}\right)}{8b^{3/2}c^2}+\frac{5\sqrt{\pi}d^2\sin\left(\frac{2a}{b}\right)S\left(\frac{2\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^2}+\frac{\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{4a}{b}\right)S\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}+\frac{\sqrt{3\pi}d^2\sin\left(\frac{6a}{b}\right)S\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2}-\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*x*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(8*b^(3/2)*c^2) + (5*d^2*Sqrt[Pi]*Cos[(2*a)/b]*
FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^2) +
 (5*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*S
in[(2*a)/b])/(8*b^(3/2)*c^2) + (d^2*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*
FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(8*b
^(3/2)*c^2)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d^2)\int \frac{(1-c^2x^2)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(12cd^2)\int \frac{x^2(1-c^2x^2}{\sqrt{a+b\sin^{}}}}{b}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d^2)\,\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc^2} - \frac{(12d^2)\,\text{S}}{}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{(2d^2)\,\text{Subst}\left(\int \left(\frac{3}{8\sqrt{a+bx}} + \frac{\cos(2x)}{2\sqrt{a+bx}} + \frac{\cos(4x)}{8\sqrt{a+bx}}\right.\right.}{bc^2}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{4bc^2} - \frac{(3d^2)\,\text{Subst}}{}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}+2x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc^2} +$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(}\right.}{4b^2c^2}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{d^2\sqrt{}}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 2.08, size = 509, normalized size = 1.36

Antiderivative was successfully verified.

```
[In] Integrate[(x*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d^2*(64*(b^(-1))^(3/2)*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[b^(-1)]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[Pi]] + 64*(b^(-1))^(3/2)*Sqrt[Pi]*FresnelS[(2*Sqr
```

```
t[b^(-1)]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[Pi]]*Sin[(2*a)/b] + (I*(11*Sqrt[2]*
E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-2*I)*(a +
b*ArcSin[c*x]))/b] - 11*Sqrt[2]*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x])
)/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - 8*E^(((2*I)*a)/b)*Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-4*I)*(a + b*ArcSin[c*x]))/b] + 8*E
^(((10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((4*I)*(a + b*Ar
cSin[c*x]))/b] - Sqrt[6]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6
*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[6]*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSi
n[c*x]))/b]*Gamma[1/2, ((6*I)*(a + b*ArcSin[c*x]))/b] + (10*I)*E^(((6*I)*a)
/b)*Sin[2*ArcSin[c*x]] + (8*I)*E^(((6*I)*a)/b)*Sin[4*ArcSin[c*x]] + (2*I)*E
^(((6*I)*a)/b)*Sin[6*ArcSin[c*x]]))/(b*E^(((6*I)*a)/b)*Sqrt[a + b*ArcSin[c*
x]])))/(32*c^2)
```

Maple [A]
time = 0.30, size = 455, normalized size = 1.22

method	result
default	$\frac{d^2\left(\sqrt{-\frac{6}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}\ \mathrm{FresnelC}\left(\frac{6\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{6}{b}}\,b}\right)\cos\left(\frac{6a}{b}\right)-\sqrt{-\frac{6}{b}}\,\sqrt{\pi}\,\sqrt{2}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/c^2*d^2/b*((-6/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*Fresn
elC(6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*cos(6*a/b)-(
-6/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*FresnelS(6*2^(1/2)/Pi^
(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*sin(6*a/b)+8*(-1/b)^(1/2)*Pi^
(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(c*x))^(1/2)/b)*cos(4*a/b)-8*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(
a+b*arcsin(c*x))^(1/2)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*
(a+b*arcsin(c*x))^(1/2)/b)+5*(a+b*arcsin(c*x))^(1/2)*cos(2*a/b)*FresnelC(2*
2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-2/b)^(1/2)*Pi^(1
/2)*2^(1/2)-5*(a+b*arcsin(c*x))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2
)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-2/b)^(1/2)*Pi^(1/2)*2^(1/2)+5*s
in(-2*(a+b*arcsin(c*x))/b+2*a/b)+4*sin(-4*(a+b*arcsin(c*x))/b+4*a/b)+sin(-6
*(a+b*arcsin(c*x))/b+6*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^2\left(\int\frac{x}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx+\int\left(-\frac{2c^2x^3}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\right)dx+\int\frac{c^4x^5}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(x/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(c*
x)), x) + Integral(-2*c**2*x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asi
n(c*x))*asin(c*x)), x) + Integral(c**4*x**5/(a*sqrt(a + b*asin(c*x)) + b*sq
rt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,{\left(d-c^2\,d\,x^2\right)}^2}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2),x)
```

```
[Out] int((x*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2), x)
```

3.439 $\int \frac{(d-c^2dx^2)^2}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=390

$$-\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c}-\frac{5d^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a}}{}\right.}{4b^{3/2}c}$$

```
[Out] -5/4*d^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*2^(1/2)*Pi^(1/2)/b^(3/2)/c+5/4*d^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(
c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c-5/8*d^2*cos(3*a/b)
*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2
)/b^(3/2)/c+5/8*d^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/
2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c-1/8*d^2*cos(5*a/b)*FresnelS(10^(1
/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*10^(1/2)*Pi^(1/2)/b^(3/2)/c+1
/8*d^2*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/
b)*10^(1/2)*Pi^(1/2)/b^(3/2)/c-2*d^2*(-c^2*x^2+1)^(5/2)/b/c/(a+b*arcsin(c*x
))^(1/2)
```

Rubi [A]
time = 0.52, antiderivative size = 390, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {4751, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\frac{5\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c}+\frac{5\sqrt{\frac{3\pi}{2}}d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}+\frac{\sqrt{\frac{5\pi}{2}}d^2\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}-\frac{5\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c}-\frac{5\sqrt{\frac{3\pi}{2}}d^2\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}-\frac{\sqrt{\frac{5\pi}{2}}d^2\cos\left(\frac{5a}{b}\right)S\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}-\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^2/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c) - (5*d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) - (d^2*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*
FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) + (5
*d^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[
a/b])/(2*b^(3/2)*c) + (5*d^2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b
*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c) + (d^2*Sqrt[(5*Pi)/2]*F
resnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(4*b^(
3/2)*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
```

```
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2}{(a+b\sin^{-1}(cx))^{3/2}}\,dx = -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(10cd^2)\int \frac{x(1-c^2x^2)^{3/2}}{\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(10d^2)\,\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(10d^2)\,\text{Subst}\left(\int \left(\frac{\sin(x)}{8\sqrt{a+bx}} + \frac{3\sin(3x)}{16\sqrt{a+bx}} + \frac{\sin(5}{16\sqrt{a-}}\right.\right.}{bc}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(5d^2)\,\text{Subst}\left(\int \frac{\sin(5x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{8bc} - \frac{(5d^2)\,\text{S}}{}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(5d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{4bc} -$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(5d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(}\right.}{2b^2c}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c} - \frac{5d^2}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 1.27, size = 522, normalized size = 1.34

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^2/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d^2*(-E^(((5*I)*a)/b) - 5*E^(((5*I)*a)/b + (2*I)*ArcSin[c*x]) - 10*E^(((5*
I)*a)/b + (4*I)*ArcSin[c*x]) - 10*E^(((5*I)*a)/b + (6*I)*ArcSin[c*x]) - 5*E
^(((5*I)*a)/b + (8*I)*ArcSin[c*x]) - E^(((5*I)*(a + 2*b*ArcSin[c*x]))/b) +
10*E^(((4*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*G
amma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 10*E^(((6*I)*a)/b + (5*I)*ArcSin[
c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b]
 + 5*Sqrt[3]*E^(((2*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c
*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] + 5*Sqrt[3]*E^(((8*I)*a
)/b + (5*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*
(a + b*ArcSin[c*x]))/b] + Sqrt[5]*E^((5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*A
rcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[5]*E^(((5
*I)*(2*a + b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((
5*I)*(a + b*ArcSin[c*x]))/b]))/(16*b*c*E^(((5*I)*(a + b*ArcSin[c*x]))/b)*Sq
rt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.28, size = 451, normalized size = 1.16

method	result
default	$-\frac{d^{2}\left(-10\sqrt{a+b\arcsin\left(cx\right)}\,\cos\left(\frac{a}{b}\right)\mathrm{S}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-10\sqrt{a+b\arcsin\left(cx\right.}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c*d^2/b*(-10*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2
)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-10*
(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+
b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-5*(a+b*arcsin(c*x))^(
1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b)*(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)-5*(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)
*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-3/b)
^(1/2)*Pi^(1/2)*2^(1/2)-2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/
2)*cos(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1
/2)/b)-2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(5*a/b)*Fre
snelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+10*cos(-(a
+b*arcsin(c*x))/b+a/b)+5*cos(-3*(a+b*arcsin(c*x))/b+3*a/b)+cos(-5*(a+b*arcs
in(c*x))/b+5*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((c^2*d*x^2 - d)^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$d^2\left(\int\left(-\frac{2c^2x^2}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx+\int\frac{c^4x^4}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\int\frac{1}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
[Out] d**2*(Integral(-2*c**2*x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x) + Integral(c**4*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a
 + b*asin(c*x))*asin(c*x)), x) + Integral(1/(a*sqrt(a + b*asin(c*x)) + b*sq
rt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(d-c^2\,d\,x^2\right)}^2}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d - c^2*d*x^2)^2/(a + b*asin(c*x))^(3/2),x)
[Out] int((d - c^2*d*x^2)^2/(a + b*asin(c*x))^(3/2), x)
```

3.440 $\int \frac{(d-c^2dx^2)^2}{x(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=289

$$-\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\text{ArcSin}(cx)}}-\frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}}-\frac{3d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{Fresne}}{}$$

```
[Out] -1/2*d^2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(
1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)-1/2*d^2*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arc
sin(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)-3*d^2*cos(2*a/
b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(3/2)-3*
d^2*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2
)/b^(3/2)-2*d^2*(-c^2*x^2+1)^(5/2)/b/c/x/(a+b*arcsin(c*x))^(1/2)-2*d^2*Unin
tegrable(1/x^2/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^(1/2),x)/b/c
```

Rubi [A]
time = 0.88, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
b^(3/2) - (3*d^2*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])
/(Sqrt[b]*Sqrt[Pi])])/b^(3/2) - (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/b^(3/2) - (d^2*Sqrt[Pi/2]*Fresn
elS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/b^(3/2) -
 (2*d^2*Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]]), x])/(
b*c)
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^2}{x\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d^2)\int \frac{(1-c^2x^2)^{3/2}}{x^2\sqrt{a+b\sin^{-1}(cx)}}\,dx}{bc} - \frac{(8cd^2)\int \frac{(1\cdots}{\sqrt{a+\cdots}}}{b\cdots}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(8d^2)\,\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{(2d\cdots}{\cdots}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{(8d^2)\,\text{Subst}\left(\int \left(\frac{3}{8\sqrt{a+bx}} + \frac{\cos(2x)}{2\sqrt{a+bx}} + \frac{\cos(\cdots}{8\sqrt{a\cdots}}\cdots\right.\right.}{b}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} + \frac{2d^2\sqrt{a+b\sin^{-1}(cx)}}{b^2} - \frac{d^2\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{a+bx}}\,dx\cdots\right.}{b}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} + \frac{2d^2\sqrt{a+b\sin^{-1}(cx)}}{b^2} - \frac{(2d^2)\,\text{Subst}\left(\int \left(\frac{1}{2\sqrt{a+\cdots}}\cdots\right.\right.}{\cdots}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} + \frac{d^2\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{b} - \frac{(2d^2)\int\cdots}{\cdots}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}} - \cdots$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}} - \cdots$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\sin^{-1}(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)C\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}} - \cdots$$

Mathematica [A]
time = 2.44, size = 0, normalized size = 0.00

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Integrate[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A]
time = 0.94, size = 0, normalized size = 0.00

$$\int \frac{\left(-c^{2} d \,x^{2}+d \right)^{2}}{x \left(a +b \arcsin \left(c x \right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c^2*d*x^2 - d)^2/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$d^{2}\left(\int \left(-\frac{2c^{2}x^{2}}{ax\sqrt{a+b\operatorname{asin}{\left(cx\right)}}+bx\sqrt{a+b\operatorname{asin}{\left(cx\right)}}\operatorname{asin}{\left(cx\right)}}\right)dx+\int \frac{c^{4}x^{4}}{ax\sqrt{a+b\operatorname{asin}{\left(cx\right)}}+bx\sqrt{a+b\operatorname{asin}{\left(cx\right)}}\operatorname{asin}{\left(cx\right)}}\,dx+\int \frac{1}{ax\sqrt{a+b\operatorname{asin}{\left(cx\right)}}+bx\sqrt{a+b\operatorname{asin}{\left(cx\right)}}\operatorname{asin}{\left(cx\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**2/x/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(-2*c**2*x**2/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b*asi
n(c*x))*asin(c*x)), x) + Integral(c**4*x**4/(a*x*sqrt(a + b*asin(c*x)) + b*
x*sqrt(a + b*asin(c*x))*asin(c*x)), x) + Integral(1/(a*x*sqrt(a + b*asin(c*
x)) + b*x*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(d-c^2\,d\,x^2\right)^2}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d - c^2*d*x^2)^2/(x*(a + b*asin(c*x))^(3/2)),x)
```

```
[Out] int((d - c^2*d*x^2)^2/(x*(a + b*asin(c*x))^(3/2)), x)
```

3.441 $\int \left(-\frac{3x}{8(1-x^2)\sqrt{\text{ArcSin}(x)}}+\frac{x\text{ArcSin}(x)^{3/2}}{(1-x^2)^2}\right)dx$

Optimal. Leaf size=42

$$-\frac{3x\sqrt{\text{ArcSin}(x)}}{4\sqrt{1-x^2}}+\frac{\text{ArcSin}(x)^{3/2}}{2(1-x^2)}$$

```
[Out] 1/2*arcsin(x)^(3/2)/(-x^2+1)-3/4*x*arcsin(x)^(1/2)/(-x^2+1)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}=0.053$, Rules used = {4767, 4745}

$$\frac{\text{ArcSin}(x)^{3/2}}{2(1-x^2)}-\frac{3x\sqrt{\text{ArcSin}(x)}}{4\sqrt{1-x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x^2)^2,
x]
```

```
[Out] (-3*x*Sqrt[ArcSin[x]])/(4*Sqrt[1 - x^2]) + ArcSin[x]^(3/2)/(2*(1 - x^2))
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(-\frac{3x}{8(1-x^2)\sqrt{\sin^{-1}(x)}} + \frac{x\sin^{-1}(x)^{3/2}}{(1-x^2)^2} \right) dx = -\left(\frac{3}{8} \int \frac{x}{(1-x^2)\sqrt{\sin^{-1}(x)}} dx \right) + \int \frac{x\sin^{-1}(x)^{3/2}}{(1-x^2)^2}$$

$$= \frac{\sin^{-1}(x)^{3/2}}{2(1-x^2)} - \frac{3}{8} \int \frac{x}{(1-x^2)\sqrt{\sin^{-1}(x)}} dx - \frac{3}{4} \int \frac{\sqrt{}}{(1}$$

$$= -\frac{3x\sqrt{\sin^{-1}(x)}}{4\sqrt{1-x^2}} + \frac{\sin^{-1}(x)^{3/2}}{2(1-x^2)}$$

Mathematica [F]
time = 3.11, size = 0, normalized size = 0.00

$$\int \left(-\frac{3x}{8(1-x^2)\sqrt{\text{ArcSin}(x)}} + \frac{x\text{ArcSin}(x)^{3/2}}{(1-x^2)^2} \right) dx$$

Verification is not applicable to the result.

```
[In] Integrate[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x
^2)^2,x]
```

```
[Out] Integrate[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x
^2)^2, x]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x\arcsin(x)^{\frac{3}{2}}}{(-x^2+1)^2} - \frac{3x}{8(-x^2+1)\sqrt{\arcsin(x)}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x)
```

```
[Out] int(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \left(-\frac{3x}{x^4\sqrt{\operatorname{asin}(x)}-2x^2\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\right)dx+\int \frac{3x^3}{x^4\sqrt{\operatorname{asin}(x)}-2x^2\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\,dx+\int \frac{8x\operatorname{asin}^2(x)}{x^4\sqrt{\operatorname{asin}(x)}-2x^2\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\,dx}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(x)**(3/2)/(-x**2+1)**2-3/8*x/(-x**2+1)/asin(x)**(1/2),x)
```

```
[Out] (Integral(-3*x/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin(x)) + sqrt(asin(x))),
 x) + Integral(3*x**3/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin(x)) + sqrt(asi
n(x))), x) + Integral(8*x*asin(x)**2/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin
(x)) + sqrt(asin(x))), x))/8
```

Giac [**A**]
time = 0.54, size = 46, normalized size = 1.10

$$-\frac{x^2\arcsin(x)^{\frac{3}{2}}}{2(x^2-1)}+\frac{1}{2}\arcsin(x)^{\frac{3}{2}}+\frac{3\sqrt{-x^2+1}\,x\sqrt{\arcsin(x)}}{4(x^2-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="giac")
```

```
[Out] -1/2*x^2*arcsin(x)^(3/2)/(x^2 - 1) + 1/2*arcsin(x)^(3/2) + 3/4*sqrt(-x^2 +
1)*x*sqrt(arcsin(x))/(x^2 - 1)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{3x}{8\sqrt{\operatorname{asin}(x)}\,(x^2-1)}+\frac{x\operatorname{asin}(x)^{3/2}}{(x^2-1)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((3*x)/(8*asin(x)^(1/2)*(x^2 - 1)) + (x*asin(x)^(3/2))/(x^2 - 1)^2,x)
[Out] int((3*x)/(8*asin(x)^(1/2)*(x^2 - 1)) + (x*asin(x)^(3/2))/(x^2 - 1)^2, x)
```

3.442 $\int (c-a^2cx^2)^{3/2} \sqrt{\mathbf{ArcSin}(ax)}\, dx$

Optimal. Leaf size=227

$$\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(ax)}+\frac{1}{4}x(c-a^2cx^2)^{3/2}\sqrt{\text{ArcSin}(ax)}+\frac{c\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}}{4a\sqrt{1-a^2x^2}}-\frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-}}{}$$

```
[Out] 1/4*c*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/128*c*F
resnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^2*c*x^2+
c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/8*c*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(1/2))*
Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+1/4*x*(-a^2*c*x^2+c)^(3/
2)*arcsin(a*x)^(1/2)+3/8*c*x*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4743, 4741, 4737, 4731, 4491, 12, 3386, 3432, 4809}

$$-\frac{\sqrt{\frac{\pi}{2}}\,c\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\text{ArcSin}(ax)}\right)}{64a\sqrt{1-a^2x^2}}-\frac{\sqrt{\pi}\,c\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}+\frac{1}{4}x\sqrt{\text{ArcSin}(ax)}\,(c-a^2cx^2)^{3/2}+\frac{c\text{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}{4a\sqrt{1-a^2x^2}}+\frac{3}{8}cx\sqrt{\text{ArcSin}(ax)}\sqrt{c-a^2cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (3*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/8 + (x*(c - a^2*c*x^2)^(3/2)*
Sqrt[ArcSin[a*x]])/4 + (c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(4*a*Sqrt[
1 - a^2*x^2]) - (c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqr
t[ArcSin[a*x]]])/(64*a*Sqrt[1 - a^2*x^2]) - (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}\,dx=\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}\,dx$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{\left(3c\sqrt{\right.}{}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-}}{}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-}}{}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-}}{}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-}}{}$$

$$=\frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}+\frac{c\sqrt{c-}}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.15, size = 166, normalized size = 0.73

$$\frac{c\sqrt{c-a^2cx^2}\left(32\text{ArcSin}(ax)^2+8\sqrt{2}\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{3}{2},-2i\text{ArcSin}(ax)\right)+8\sqrt{2}\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{3}{2},2i\text{ArcSin}(ax)\right)+\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{3}{2},-4i\text{ArcSin}(ax)\right)+\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{3}{2},4i\text{ArcSin}(ax)\right)\right)}{128a\sqrt{1-a^2x^2}\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(32*ArcSin[a*x]^2 + 8*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]
*Gamma[3/2, (-2*I)*ArcSin[a*x]] + 8*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[3/2,
(2*I)*ArcSin[a*x]] + Sqrt[(-I)*ArcSin[a*x]]*Gamma[3/2, (-4*I)*ArcSin[a*x]]
+ Sqrt[I*ArcSin[a*x]]*Gamma[3/2, (4*I)*ArcSin[a*x]]))/(128*a*Sqrt[1 - a^2*x
^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]
time = 0.32, size = 0, normalized size = 0.00

$$\int \left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \sqrt{\arcsin \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \left(- c \left(a x - 1\right) \left(a x + 1\right)\right)^{\frac{3}{2}} \sqrt{\operatorname{asin}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(1/2),x)
```

```
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)*sqrt(asin(a*x)), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{\mathrm{asin}\left(a\,x\right)}\,{\left(c-a^2\,c\,x^2\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2), x)
```

3.443 $\int \sqrt{c-a^2cx^2}\,\sqrt{\mathbf{ArcSin}(ax)}\,dx$

Optimal. Leaf size=130

$$\frac{1}{2}x\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}+\frac{\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}}-\frac{\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

```
[Out] 1/3*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/8*Fresnel
S(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1
)^(1/2)+1/2*x*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {4741, 4737, 4731, 4491, 12, 3386, 3432}

$$-\frac{\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}+\frac{\text{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}{3a\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{\text{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a
*x]^(3/2))/(3*a*Sqrt[1 - a^2*x^2]) - (Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS
[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{\sqrt{c-a^2cx^2}\int \frac{\sqrt{\sin^{-1}(ax)}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} - \frac{\left(a\sqrt{c \cdots\right.}{\cdots}$$

$$= \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} - \frac{\sqrt{c-a^2cx^2}\cdots}{\cdots}$$

$$= \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} - \frac{\sqrt{c-a^2cx^2}\cdots}{\cdots}$$

$$= \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} - \frac{\sqrt{c-a^2cx^2}\cdots}{\cdots}$$

$$= \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} - \frac{\sqrt{c-a^2cx^2}\cdots}{\cdots}$$

$$= \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} - \frac{\sqrt{\pi}\,\sqrt{c-a^2\cdots}}{8\cdots}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.05, size = 138, normalized size = 1.06

$$\frac{\sqrt{c-a^2cx^2}\left(16\text{ArcSin}(ax)\left(3ax\sqrt{1-a^2x^2}+2\text{ArcSin}(ax)\right)+3\sqrt{2}\,\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},-2i\text{ArcSin}(ax)\right)+3\sqrt{2}\,\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},2i\text{ArcSin}(ax)\right)\right)}{96a\sqrt{1-a^2x^2}\,\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*(16*ArcSin[a*x]*(3*a*x*Sqrt[1 - a^2*x^2] + 2*ArcSin[a*
x]) + 3*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] + 3*S
qrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[a*x]]))/(96*a*Sqrt[1 - a
^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]
time = 0.33, size = 0, normalized size = 0.00

$$\int \sqrt{-a^2c\,x^2+c}\,\sqrt{\arcsin\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-c\,(ax-1)\,(ax+1)}\,\sqrt{\operatorname{asin}\,(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(1/2),x)
```

```
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*sqrt(asin(a*x)), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{\operatorname{asin}(a\,x)}\,\sqrt{c-a^2\,c\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2),x)
```

```
[Out] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2), x)
```

3.444 $\int \frac{\sqrt{\text{ArcSin}(ax)}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=44

$$\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

```
[Out] 2/3*arcsin(a*x)^(3/2)*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = $\{4737\}$

$$\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcSin[a*x]]/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))/(3*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\sin^{-1}(ax)}}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sqrt{\sin^{-1}(ax)}}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 44, normalized size = 1.00

$$\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[ArcSin[a*x]]/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))/(3*a*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.11, size = 38, normalized size = 0.86

method	result	size
default	$\frac{2 \arcsin \left(a x \right)^{\frac{3}{2}} \sqrt{-a^{2} x^{2}+1}}{3 a \sqrt{-c \left(a^{2} x^{2}-1\right)}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*arcsin(a*x)^(3/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{asin}{\left(a x \right)}}}{\sqrt{- c \left(a x - 1\right) \left(a x + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(1/2),x)
[Out] Integral(sqrt(asin(a*x))/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(a*x))/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{\mathrm{asin}\left(a\,x\right)}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(1/2), x)
```

3.445 $\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=91

$$\frac{x\sqrt{\text{ArcSin}(ax)}}{c\sqrt{c-a^2cx^2}}-\frac{a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x}{(1-a^2x^2)\sqrt{\text{ArcSin}(ax)}},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] x*arcsin(a*x)^(1/2)/c/(-a^2*c*x^2+c)^(1/2)-1/2*a*(-a^2*x^2+1)^(1/2)*Uninteg
rable(x/(-a^2*x^2+1)/arcsin(a*x)^(1/2),x)/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*Sqrt[ArcSin[a*x]])/(c*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Defer[
Int][x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{\sqrt{\sin^{-1}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx=\frac{x\sqrt{\sin^{-1}(ax)}}{c\sqrt{c-a^2cx^2}}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)\sqrt{\sin^{-1}(ax)}}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [A]
time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2),x]
```

[Out] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2), x]

Maple [A]
time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arcsin \left(a x\right)}}{\left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x)

[Out] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x)

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima: expt: undefined: 0 to a negative exponent.

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{asin}{\left(a x \right)}}}{\left(- c \left(a x - 1\right) \left(a x + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(3/2),x)

[Out] Integral(sqrt(asin(a*x))/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(a*x))/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\mathrm{asin}\left(a\,x\right)}}{{\left(c-a^2\,c\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(3/2), x)
```

3.446 $\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=187

$$\frac{x\sqrt{\text{ArcSin}(ax)}}{3c\,(c-a^2cx^2)^{3/2}}+\frac{2x\sqrt{\text{ArcSin}(ax)}}{3c^2\sqrt{c-a^2cx^2}}-\frac{a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x}{(1-a^2x^2)^2\sqrt{\text{ArcSin}(ax)}},x\right)}{6c^2\sqrt{c-a^2cx^2}}-\frac{a\sqrt{1-a^2x^2}\,\text{Int}\Big(\frac{}{(1-a^2}}{3c^2\sqrt{c-}}$$

```
[Out] 1/3*x*arcsin(a*x)^(1/2)/c/(-a^2*c*x^2+c)^(3/2)+2/3*x*arcsin(a*x)^(1/2)/c^2/
(-a^2*c*x^2+c)^(1/2)-1/6*a*(-a^2*x^2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^2
/arcsin(a*x)^(1/2),x)/c^2/(-a^2*c*x^2+c)^(1/2)-1/3*a*(-a^2*x^2+1)^(1/2)*Uni
ntegrable(x/(-a^2*x^2+1)/arcsin(a*x)^(1/2),x)/c^2/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (x*Sqrt[ArcSin[a*x]])/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Sqrt[ArcSin[a*x]])
/(3*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*
x^2)^2*Sqrt[ArcSin[a*x]]), x])/(6*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^
2*x^2]*Defer[Int][x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(3*c^2*Sqrt[c -
a^2*c*x^2])
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\sin^{-1}(ax)}}{(c-a^2cx^2)^{5/2}}\,dx &= \frac{x\sqrt{\sin^{-1}(ax)}}{3c\,(c-a^2cx^2)^{3/2}}+\frac{2\int \frac{\sqrt{\sin^{-1}(ax)}}{(c-a^2cx^2)^{3/2}}\,dx}{3c}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^2\sqrt{\sin^{-1}(ax)}}\,dx}{6c^2\sqrt{c-a^2cx^2}} \\ &= \frac{x\sqrt{\sin^{-1}(ax)}}{3c\,(c-a^2cx^2)^{3/2}}+\frac{2x\sqrt{\sin^{-1}(ax)}}{3c^2\sqrt{c-a^2cx^2}}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^2\sqrt{\sin^{-1}(ax)}}\,dx}{6c^2\sqrt{c-a^2cx^2}}-\end{aligned}$$

Mathematica [A]
time = 1.21, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\text{ArcSin}(ax)}}{(c-a^2cx^2)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2), x]
```

Maple [A]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arcsin(ax)}}{(-a^2c\,x^2+c)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{asin}(ax)}}{(-c(ax-1)(ax+1))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(5/2),x)
[Out] Integral(sqrt(asin(a*x))/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(a*x))/(-a^2*c*x^2 + c)^(5/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\operatorname{asin}(a\,x)}}{{\left(c-a^2\,c\,x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(5/2),x)
[Out] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(5/2), x)
```

3.447 $\int (c-a^2cx^2)^{3/2} \text{ArcSin}(ax)^{3/2} \, dx$

Optimal. Leaf size=363

$$\frac{27c\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(}}{32a}$$

```
[Out] 1/4*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2)+3/8*c*x*arcsin(a*x)^(3/2)*(-a^
2*c*x^2+c)^(1/2)+3/20*c*arcsin(a*x)^(5/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+
1)^(1/2)-3/1024*c*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi
^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/32*c*FresnelC(2*arcsin(a
*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/32
*c*(-a^2*x^2+1)^(3/2)*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a+27/256*c*(-a
^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1/2)-9/32*a*c*x^2*(-a^2
*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/(-a^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 363, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {4743, 4741, 4737, 4725, 4809, 3393, 3385, 3433, 4767, 4753}

$$-\frac{3\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\text{ArcSin}(ax)}\right)}{512a\sqrt{1-a^2x^2}}-\frac{3\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{3c\text{ArcSin}(ax)^{5/2}\sqrt{c-a^2cx^2}}{20a\sqrt{1-a^2x^2}}+\frac{1}{4}x\text{ArcSin}(ax)^{3/2}\left(c-a^2cx^2\right)^{3/2}+\frac{3}{8}cx\text{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}+\frac{3c(1-a^2x^2)^{3/2}\sqrt{\text{ArcSin}(ax)}\sqrt{c-a^2cx^2}}{32a}-\frac{9acx^2\sqrt{\text{ArcSin}(ax)}\sqrt{c-a^2cx^2}}{32\sqrt{1-a^2x^2}}+\frac{27c\sqrt{\text{ArcSin}(ax)}\sqrt{c-a^2cx^2}}{256a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2),x]
```

```
[Out] (27*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(256*a*Sqrt[1 - a^2*x^2]) - (9
*a*c*x^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*Sqrt[1 - a^2*x^2]) + (3
*c*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*a) + (3*c
*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcS
in[a*x]^(3/2))/4 + (3*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2))/(20*a*Sqrt[1
 - a^2*x^2]) - (3*c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sq
rt[ArcSin[a*x]]])/(512*a*Sqrt[1 - a^2*x^2]) - (3*c*Sqrt[Pi]*Sqrt[c - a^2*c*
x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}\,dx = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}+\frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}\,dx -$$

$$= \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{32a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/}$$

$$= -\frac{9acx^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(}}{32a}$$

$$= -\frac{9acx^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(}}{32a}$$

$$= -\frac{9c\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1}{}$$

$$= \frac{27c\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1-}{}$$

$$= \frac{27c\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1-}{}$$

$$= \frac{27c\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{256a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1-}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.30, size = 186, normalized size = 0.51

$$\frac{c\sqrt{c-a^2cx^2}\left(-240\sqrt{\pi}\,\sqrt{\mathrm{ArcSin}(ax)^2}\,\mathrm{FresnelC}\left(\frac{2\sqrt{\mathrm{ArcSin}(ax)}}{\sqrt{\pi}}\right)+\sqrt{\mathrm{ArcSin}(ax)}\left(5\sqrt{i\mathrm{ArcSin}(ax)}\,\Gamma\left(\frac{5}{2},-4i\mathrm{ArcSin}(ax)\right)+5\sqrt{-i\mathrm{ArcSin}(ax)}\,\Gamma\left(\frac{5}{2},4i\mathrm{ArcSin}(ax)\right)+32\sqrt{\mathrm{ArcSin}(ax)^2}\left(12\mathrm{ArcSin}(ax)^2+15\cos(2\mathrm{ArcSin}(ax))+20\mathrm{ArcSin}(ax)\sin(2\mathrm{ArcSin}(ax))\right)\right)\right)}{2560a\sqrt{1-a^2x^2}\,\sqrt{\mathrm{ArcSin}(ax)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(-240*Sqrt[Pi]*Sqrt[ArcSin[a*x]^2]*FresnelC[(2*Sqrt[
ArcSin[a*x]])/Sqrt[Pi]] + Sqrt[ArcSin[a*x]]*(5*Sqrt[I*ArcSin[a*x]]*Gamma[5/
2, (-4*I)*ArcSin[a*x]] + 5*Sqrt[(-I)*ArcSin[a*x]]*Gamma[5/2, (4*I)*ArcSin[a
*x]] + 32*Sqrt[ArcSin[a*x]^2]*(12*ArcSin[a*x]^2 + 15*Cos[2*ArcSin[a*x]] + 2
```

```
0*ArcSin[a*x]*Sin[2*ArcSin[a*x]])))/(2560*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[
a*x]^2])
```

Maple [F]
time = 0.29, size = 0, normalized size = 0.00

$$\int \left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arcsin \left(a x \right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \text{asin}(a\,x)^{3/2}\,\left(c-a^2\,c\,x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2), x)
```

3.448 $\int \sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}\,dx$

Optimal. Leaf size=219

$$\frac{3\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}}{16a\sqrt{1-a^2x^2}}-\frac{3ax^2\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}}{8\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}+\frac{\sqrt{c-a^2cx}}{5a\sqrt{}}$$

[Out] 1/2*x*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)+1/5*arcsin(a*x)^(5/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/32*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/16*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/8*a*x^2*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/(-a^2*x^2+1)^(1/2)

Rubi [A]

time = 0.16, antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {4741, 4737, 4725, 4809, 3393, 3385, 3433}

$$-\frac{3\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{\text{ArcSin}(ax)^{5/2}\sqrt{c-a^2cx^2}}{5a\sqrt{1-a^2x^2}}+\frac{1}{2}x\text{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}-\frac{3ax^2\sqrt{\text{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}+\frac{3\sqrt{\text{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}}{16a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2),x]

[Out] (3*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(16*a*Sqrt[1 - a^2*x^2]) - (3*a*x^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[1 - a^2*x^2]) - (3*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\,\int \frac{\sin^{-1}(ax)^{3/2}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} - \frac{\left(3a\sqrt{c-\right.}{}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-}}{5}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-}}{5}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2} + \frac{\sqrt{c-}}{5}$$

$$= \frac{3\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-}$$

$$= \frac{3\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-}$$

$$= \frac{3\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.08, size = 158, normalized size = 0.72

$$\frac{\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}\left(32\text{ArcSin}(ax)\sqrt{\text{ArcSin}(ax)^2}\left(5ax\sqrt{1-a^2x^2}+2\text{ArcSin}(ax)\right)+15\sqrt{2}\,\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{3}{2},-2i\text{ArcSin}(ax)\right)+15\sqrt{2}\,\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{3}{2},2i\text{ArcSin}(ax)\right)\right)}{320a\sqrt{1-a^2x^2}\,\sqrt{\text{ArcSin}(ax)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2),x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]*(32*ArcSin[a*x]*Sqrt[ArcSin[a*x]^2]*
(5*a*x*Sqrt[1 - a^2*x^2] + 2*ArcSin[a*x]) + 15*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*
Gamma[3/2, (-2*I)*ArcSin[a*x]] + 15*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[3/
2, (2*I)*ArcSin[a*x]]))/(320*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]^2])
```

Maple [F]
time = 0.32, size = 0, normalized size = 0.00

$$\int \sqrt{-a^2c\,x^2+c}\;\arcsin\left(ax\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-c\left(ax-1\right)\left(ax+1\right)}\,\operatorname{asin}^{\frac{3}{2}}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(3/2),x)
```

```
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**(3/2), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \operatorname{asin}(a\,x)^{3/2}\,\sqrt{c-a^2\,c\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2),x)
```

```
[Out] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2), x)
```

3.449 $\int \frac{\mathbf{ArcSin}(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=44

$$\frac{2\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

```
[Out] 2/5*arcsin(a*x)^(5/2)*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = $\{4737\}$

$$\frac{2\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^(3/2)/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^{3/2}}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 44, normalized size = 1.00

$$\frac{2\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^(3/2)/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.11, size = 38, normalized size = 0.86

method	result	size
default	$\frac{2 \arcsin(ax)^{\frac{5}{2}} \sqrt{-a^2x^2+1}}{5a\sqrt{-c\,(a^2x^2-1)}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/5*arcsin(a*x)^(5/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{\frac{3}{2}}(ax)}{\sqrt{-c\,(ax-1)\,(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(3/2)/(-a**2*c*x**2+c)**(1/2),x)
[Out] Integral(asin(a*x)**(3/2)/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^(3/2)/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{asin}(a\,x)^{3/2}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(1/2), x)
```

3.450 $\int \frac{\text{ArcSin}(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=91

$$\frac{x\text{ArcSin}(ax)^{3/2}}{c\sqrt{c-a^2cx^2}}-\frac{3a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x\sqrt{\text{ArcSin}(ax)}}{1-a^2x^2},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] x*arcsin(a*x)^(3/2)/c/(-a^2*c*x^2+c)^(1/2)-3/2*a*(-a^2*x^2+1)^(1/2)*Uninteg
rable(x*arcsin(a*x)^(1/2)/(-a^2*x^2+1),x)/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\text{ArcSin}(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^(3/2))/(c*Sqrt[c - a^2*c*x^2]) - (3*a*Sqrt[1 - a^2*x^2]*Defe
r[Int][(x*Sqrt[ArcSin[a*x]])/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx=\frac{x\sin^{-1}(ax)^{3/2}}{c\sqrt{c-a^2cx^2}}-\frac{\left(3a\sqrt{1-a^2x^2}\right)\int \frac{x\sqrt{\sin^{-1}(ax)}}{1-a^2x^2}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [A]
time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{\text{ArcSin}(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] Integrate[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2), x]
```

Maple [A]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{\arcsin \left(a x\right)^{\frac{3}{2}}}{\left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{\frac{3}{2}}{\left(a x \right)}}{\left(- c \left(a x - 1\right) \left(a x + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(3/2)/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(asin(a*x)**(3/2)/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{asin}(a\,x)^{3/2}}{{\left(c-a^2\,c\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(3/2), x)
```

3.451 $\int (c-a^2cx^2)^{3/2} \operatorname{ArcSin}(ax)^{5/2}\,dx$

Optimal. Leaf size=431

$$-\frac{225}{512}cx\sqrt{c-a^2cx^2}\,\sqrt{\operatorname{ArcSin}(ax)}-\frac{15}{256}cx(1-a^2x^2)\,\sqrt{c-a^2cx^2}\,\sqrt{\operatorname{ArcSin}(ax)}+\frac{45c\sqrt{c-a^2cx^2}\,\operatorname{ArcSin}(a}{256a\sqrt{1-a^2x^2}}$$

```
[Out] 1/4*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2)+5/32*c*(-a^2*x^2+1)^(3/2)*arcs
in(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a+3/8*c*x*arcsin(a*x)^(5/2)*(-a^2*c*x^2+
c)^(1/2)+45/256*c*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/
2)-15/32*a*c*x^2*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+
3/28*c*arcsin(a*x)^(7/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+15/8192*
c*FresnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^2*c*x
^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+15/128*c*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(
1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-225/512*c*x*(-a^2*
c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)-15/256*c*x*(-a^2*x^2+1)*(-a^2*c*x^2+c)^(1/
2)*arcsin(a*x)^(1/2)
```

Rubi [A]

time = 0.40, antiderivative size = 431, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4743, 4741, 4737, 4725, 4795, 4731, 4491, 12, 3386, 3432, 4767, 4809}

$$\frac{15\sqrt{\frac{\pi}{2}}\,c\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\operatorname{ArcSin}(ax)}\right)}{4096a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}\,c\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\operatorname{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}+\frac{3c\operatorname{ArcSin}(ax)^{7/2}\sqrt{c-a^2cx^2}}{28a\sqrt{1-a^2x^2}}+\frac{1}{4}x\operatorname{ArcSin}(ax)^{5/2}\left(c-a^2cx^2\right)^{3/2}+\frac{3}{8}cx\operatorname{ArcSin}(ax)^{5/2}\sqrt{c-a^2cx^2}+\frac{5c(1-a^2x^2)^{3/2}\operatorname{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}{32a}-\frac{15acx^2\operatorname{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}{32\sqrt{1-a^2x^2}}+\frac{45c\operatorname{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}{256a\sqrt{1-a^2x^2}}-\frac{225}{512}cx\sqrt{\operatorname{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}-\frac{15}{256}cx(1-a^2x^2)\,\sqrt{\operatorname{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2),x]
```

```
[Out] (-225*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/512 - (15*c*x*(1 - a^2*x^2
)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/256 + (45*c*Sqrt[c - a^2*c*x^2]*Ar
cSin[a*x]^(3/2))/(256*a*Sqrt[1 - a^2*x^2]) - (15*a*c*x^2*Sqrt[c - a^2*c*x^2
]*ArcSin[a*x]^(3/2))/(32*Sqrt[1 - a^2*x^2]) + (5*c*(1 - a^2*x^2)^(3/2)*Sqrt
[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(32*a) + (3*c*x*Sqrt[c - a^2*c*x^2]*ArcS
in[a*x]^(5/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2))/4 + (3*c*Sqr
t[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(28*a*Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[P
i/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(4096*a*
Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[Ar
cSin[a*x]])/Sqrt[Pi]])/(128*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}\,dx = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}+\frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{5/2}\,dx -$$

$$= \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{32a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^5$$

$$= -\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}-\frac{15acx^2\sqrt{c-a^2cx^2}\,\sin^{-}}{32\sqrt{1-a^2x^2}}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sqrt{\sin}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sqrt{\sin}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sqrt{\sin}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sqrt{\sin}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sqrt{\sin}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\,\sqrt{\sin}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.24, size = 180, normalized size = 0.42

$$\frac{c\sqrt{c-a^2cx^2}\left(1536\text{ArcSin}(ax)^4+4480\text{ArcSin}(ax)^2\cos(2\text{ArcSin}(ax))+1680\sqrt{\pi}\sqrt{\text{ArcSin}(ax)}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)-7\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{7}{2},-4i\text{ArcSin}(ax)\right)-7\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{7}{2},4i\text{ArcSin}(ax)\right)-3360\text{ArcSin}(ax)\sin(2\text{ArcSin}(ax))+3584\text{ArcSin}(ax)^3\sin(2\text{ArcSin}(ax))\right)}{14336a\sqrt{1-a^2x^2}\,\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(1536*ArcSin[a*x]^4 + 4480*ArcSin[a*x]^2*Cos[2*ArcSi
n[a*x]] + 1680*Sqrt[Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sq
rt[Pi]] - 7*Sqrt[(-I)*ArcSin[a*x]]*Gamma[7/2, (-4*I)*ArcSin[a*x]] - 7*Sqrt[
I*ArcSin[a*x]]*Gamma[7/2, (4*I)*ArcSin[a*x]] - 3360*ArcSin[a*x]*Sin[2*ArcSi
n[a*x]] + 3584*ArcSin[a*x]^3*Sin[2*ArcSin[a*x]]))/(14336*a*Sqrt[1 - a^2*x^2
]*Sqrt[ArcSin[a*x]])
```

Maple [F]
time = 0.29, size = 0, normalized size = 0.00

$$\int \left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arcsin \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 8568 deep
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{asin}(a\,x)^{5/2}\,{\left(c-a^2\,c\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2), x)
```

3.452 $\int \sqrt{c-a^2cx^2}\,\textbf{ArcSin}(ax)^{5/2}\,dx$

Optimal. Leaf size=247

$$-\frac{15}{32}x\sqrt{c-a^2cx^2}\,\sqrt{\mathrm{ArcSin}(ax)}+\frac{5\sqrt{c-a^2cx^2}\,\mathrm{ArcSin}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}}-\frac{5ax^2\sqrt{c-a^2cx^2}\,\mathrm{ArcSin}(ax)^{3/2}}{8\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a$$

```
[Out] 1/2*x*arcsin(a*x)^(5/2)*(-a^2*c*x^2+c)^(1/2)+5/16*arcsin(a*x)^(3/2)*(-a^2*c
*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-5/8*a*x^2*arcsin(a*x)^(3/2)*(-a^2*c*x^2+
c)^(1/2)/(-a^2*x^2+1)^(1/2)+1/7*arcsin(a*x)^(7/2)*(-a^2*c*x^2+c)^(1/2)/a/(-
a^2*x^2+1)^(1/2)+15/128*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a
^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-15/32*x*(-a^2*c*x^2+c)^(1/2)*arcsin(
a*x)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4741, 4737, 4725, 4795, 4731, 4491, 12, 3386, 3432}

$$\frac{15\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\mathrm{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}+\frac{\mathrm{ArcSin}(ax)^{7/2}\sqrt{c-a^2cx^2}}{7a\sqrt{1-a^2x^2}}+\frac{1}{2}x\mathrm{ArcSin}(ax)^{5/2}\sqrt{c-a^2cx^2}-\frac{5ax^2\mathrm{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}+\frac{5\mathrm{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}{16a\sqrt{1-a^2x^2}}-\frac{15}{32}x\sqrt{\mathrm{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2),x]
```

```
[Out] (-15*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/32 + (5*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(16*a*Sqrt[1 - a^2*x^2]) - (5*a*x^2*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x
]^(5/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[1 - a^2*x^2]
) + (15*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi
]])/(128*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{5/2}\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{5/2} + \frac{\sqrt{c-a^2cx^2}\int\frac{\sin^{-1}(ax)^{5/2}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} - \frac{\left(5a\sqrt{c-\right.}{}$$

$$= -\frac{5ax^2\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{5/2} + \frac{\sqrt{c-a^2}}{7a}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} - \frac{5ax^2\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-}}{8}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-}}{8}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-}}{8}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-}}{8}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)} + \frac{5\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-}}{8}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.08, size = 158, normalized size = 0.64

$$\frac{\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}\left(64(\text{ArcSin}(ax)^2)^{3/2}\left(7ax\sqrt{1-a^2x^2}+2\text{ArcSin}(ax)\right)+35i\sqrt{2}\,\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{5}{2},-2i\text{ArcSin}(ax)\right)-35i\sqrt{2}\,\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{5}{2},2i\text{ArcSin}(ax)\right)\right)}{896a\sqrt{1-a^2x^2}\,\sqrt{\text{ArcSin}(ax)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2),x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]*(64*(ArcSin[a*x]^2)^(3/2)*(7*a*x*Sqr
t[1 - a^2*x^2] + 2*ArcSin[a*x]) + (35*I)*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[
5/2, (-2*I)*ArcSin[a*x]] - (35*I)*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[5/2,
 (2*I)*ArcSin[a*x]]))/(896*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]^2])
```

Maple [F]
time = 0.32, size = 0, normalized size = 0.00

$$\int \sqrt{-a^2 c\,x^2+c}\ \arcsin\left(a x\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4368 deep
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{asin}(a\,x)^{5/2}\,\sqrt{c-a^2\,c\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2),x)
```

```
[Out] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2), x)
```

3.453 $\int \frac{\textbf{ArcSin}(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal. Leaf size=44

$$\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

```
[Out] 2/7*arcsin(a*x)^(7/2)*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {4737}

$$\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^(5/2)/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{\sin^{-1}(ax)^{5/2}}{\sqrt{1-a^2x^2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= \frac{2\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 44, normalized size = 1.00

$$\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^(5/2)/Sqrt[c - a^2*c*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.10, size = 38, normalized size = 0.86

method	result	size
default	$\frac{2 \arcsin \left(a x\right)^{\frac{7}{2}} \sqrt{-a^{2} x^{2}+1}}{7 a \sqrt{-c \left(a^{2} x^{2}-1\right)}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/7*arcsin(a*x)^(7/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(5/2)/(-a**2*c*x**2+c)**(1/2),x)
[Out] Exception raised: SystemError >> excessive stack use: stack is 3004 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^(5/2)/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{asin}(a\,x)^{5/2}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(1/2), x)
```

3.454 $\int \frac{\text{ArcSin}(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=91

$$\frac{x\text{ArcSin}(ax)^{5/2}}{c\sqrt{c-a^2cx^2}}-\frac{5a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x\text{ArcSin}(ax)^{3/2}}{1-a^2x^2},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] x*arcsin(a*x)^(5/2)/c/(-a^2*c*x^2+c)^(1/2)-5/2*a*(-a^2*x^2+1)^(1/2)*Uninteg
rable(x*arcsin(a*x)^(3/2)/(-a^2*x^2+1),x)/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\text{ArcSin}(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^(5/2))/(c*Sqrt[c - a^2*c*x^2]) - (5*a*Sqrt[1 - a^2*x^2]*Defe
r[Int][(x*ArcSin[a*x]^(3/2))/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx=\frac{x\sin^{-1}(ax)^{5/2}}{c\sqrt{c-a^2cx^2}}-\frac{\left(5a\sqrt{1-a^2x^2}\right)\int\frac{x\sin^{-1}(ax)^{3/2}}{1-a^2x^2}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [A]
time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{\text{ArcSin}(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] Integrate[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2), x]
```

Maple [A]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\arcsin(ax)^{\frac{5}{2}}}{(-a^2 c\,x^2 + c)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x)
[Out] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**(5/2)/(-a**2*c*x**2+c)**(3/2),x)
[Out] Exception raised: SystemError >> excessive stack use: stack is 3004 deep
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{asin}(a\,x)^{5/2}}{{\left(c-a^2\,c\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(3/2), x)
```

3.455 $\int \left(a^2-x^2\right)^{3/2} \sqrt{\mathbf{ArcSin}\left(\frac{x}{a}\right)}\, dx$

Optimal. Leaf size=226

$$\frac{3}{8}a^2x\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}+\frac{a^3\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}}-\frac{a^3\sqrt{\frac{\pi}{2}}\,\sqrt{a^2 \cdots}}{\cdots}$$

```
[Out] 1/4*a^3*arcsin(x/a)^(3/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)-1/128*a^3*Fresn
elS(2*2^(1/2)/Pi^(1/2)*arcsin(x/a)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2-x^2)^(1/2)/
(1-x^2/a^2)^(1/2)-1/8*a^3*FresnelS(2*arcsin(x/a)^(1/2)/Pi^(1/2))*Pi^(1/2)*(
a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+1/4*x*(a^2-x^2)^(3/2)*arcsin(x/a)^(1/2)+3/
8*a^2*x*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4743, 4741, 4737, 4731, 4491, 12, 3386, 3432, 4809}

$$\frac{3}{8}a^2x\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}-\frac{\sqrt{\frac{\pi}{2}}\,a^3\sqrt{a^2-x^2}\,S\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}\right)}{64\sqrt{1-\frac{x^2}{a^2}}}-\frac{\sqrt{\pi}\,a^3\sqrt{a^2-x^2}\,S\left(\frac{2\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}+\frac{a^3\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[(a^2 - x^2)^(3/2)*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (3*a^2*x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/8 + (x*(a^2 - x^2)^(3/2)*Sqrt[A
rcSin[x/a]])/4 + (a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2))/(4*Sqrt[1 - x^2/a^
2]) - (a^3*Sqrt[Pi/2]*Sqrt[a^2 - x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a
]]])/(64*Sqrt[1 - x^2/a^2]) - (a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqr
t[ArcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
```

```
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\,dx = \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}\left(3a^2\right)\int \sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\,dx - $$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} - \frac{\left(3a\sqrt{a^2\right.}}{}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-}}{4}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-}}{4}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-}}{4}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-}}{4}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-}}{4}$$

Mathematica [C] Result contains complex when optimal does not.

time = 0.15, size = 183, normalized size = 0.81

$$\frac{a^3\sqrt{a^2-x^2}\left(32\text{ArcSin}\left(\frac{x}{a}\right)^2+8\sqrt{2}\sqrt{-i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{3}{2},-2i\text{ArcSin}\left(\frac{x}{a}\right)\right)+8\sqrt{2}\sqrt{i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{3}{2},2i\text{ArcSin}\left(\frac{x}{a}\right)\right)+\sqrt{-i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{3}{2},-4i\text{ArcSin}\left(\frac{x}{a}\right)\right)+\sqrt{i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{3}{2},4i\text{ArcSin}\left(\frac{x}{a}\right)\right)\right)}{128\sqrt{1-\frac{x^2}{a^2}}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a^2 - x^2)^(3/2)*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (a^3*Sqrt[a^2 - x^2]*(32*ArcSin[x/a]^2 + 8*Sqrt[2]*Sqrt[(-I)*ArcSin[x/a]]*G
amma[3/2, (-2*I)*ArcSin[x/a]] + 8*Sqrt[2]*Sqrt[I*ArcSin[x/a]]*Gamma[3/2, (2
*I)*ArcSin[x/a]] + Sqrt[(-I)*ArcSin[x/a]]*Gamma[3/2, (-4*I)*ArcSin[x/a]] +
Sqrt[I*ArcSin[x/a]]*Gamma[3/2, (4*I)*ArcSin[x/a]]))/(128*Sqrt[1 - x^2/a^2]*
Sqrt[ArcSin[x/a]])
```

Maple [F]
time = 0.32, size = 0, normalized size = 0.00

$$\int \left(a^2-x^2\right)^{\frac{3}{2}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x)
```

```
[Out] int((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \left(-\left(-a+x\right)\left(a+x\right)\right)^{\frac{3}{2}}\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(3/2)*asin(x/a)**(1/2),x)
```

```
[Out] Integral((-(-a + x)*(a + x))**(3/2)*sqrt(asin(x/a)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((a^2 - x^2)^(3/2)*sqrt(arcsin(x/a)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}\,{\left(a^2-x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(1/2)*(a^2 - x^2)^(3/2),x)
```

```
[Out] int(asin(x/a)^(1/2)*(a^2 - x^2)^(3/2), x)
```

3.456 $\int \sqrt{a^2-x^2} \sqrt{\text{ArcSin}\left(\frac{x}{a}\right)} \, dx$

Optimal. Leaf size=126

$$\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}+\frac{a\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}-\frac{a\sqrt{\pi}\sqrt{a^2-x^2}\,S\left(\frac{2\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$

```
[Out] 1/3*a*arcsin(x/a)^(3/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)-1/8*a*FresnelS(2*
arcsin(x/a)^(1/2)/Pi^(1/2))*Pi^(1/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+1/2*
x*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {4741, 4737, 4731, 4491, 12, 3386, 3432}

$$-\frac{\sqrt{\pi}\,a\sqrt{a^2-x^2}\,S\left(\frac{2\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3
/2))/(3*Sqrt[1 - x^2/a^2]) - (a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqrt[A
rcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}\,dx = \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{\sqrt{a^2-x^2}\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{1-\frac{x^2}{a^2}}}dx}{2\sqrt{1-\frac{x^2}{a^2}}} - \frac{\sqrt{a^2-x^2}}{4a}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Su}}{}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Su}}{}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Su}}{}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a\sqrt{a^2-x^2}\right)\text{Su}}{}$$

$$= \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)} + \frac{a\sqrt{a^2-x^2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}} - \frac{a\sqrt{\pi}\sqrt{a^2-x^2}}{8\sqrt{}}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.06, size = 148, normalized size = 1.17

$$\frac{\sqrt{a^2-x^2}\left(48x\sqrt{1-\frac{x^2}{a^2}}\text{ArcSin}\left(\frac{x}{a}\right)+32a\text{ArcSin}\left(\frac{x}{a}\right)^2+3\sqrt{2}\,a\sqrt{-i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{1}{2},-2i\text{ArcSin}\left(\frac{x}{a}\right)\right)+3\sqrt{2}\,a\sqrt{i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{1}{2},2i\text{ArcSin}\left(\frac{x}{a}\right)\right)\right)}{96\sqrt{1-\frac{x^2}{a^2}}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (Sqrt[a^2 - x^2]*(48*x*Sqrt[1 - x^2/a^2]*ArcSin[x/a] + 32*a*ArcSin[x/a]^2 +
 3*Sqrt[2]*a*Sqrt[(-I)*ArcSin[x/a]]*Gamma[1/2, (-2*I)*ArcSin[x/a]] + 3*Sqrt
[2]*a*Sqrt[I*ArcSin[x/a]]*Gamma[1/2, (2*I)*ArcSin[x/a]]))/(96*Sqrt[1 - x^2/
a^2]*Sqrt[ArcSin[x/a]])
```

Maple [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int \sqrt{a^{2}-x^{2}}\, \sqrt{\arcsin \left(\frac{x}{a}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x)
```

```
[Out] int((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-\left(-a+x\right)\left(a+x\right)}\, \sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(1/2)*asin(x/a)**(1/2),x)
```

```
[Out] Integral(sqrt(-(-a + x)*(a + x))*sqrt(asin(x/a)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(a^2 - x^2)*sqrt(arcsin(x/a)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{\mathrm{asin}\left(\frac{x}{a}\right)}\,\sqrt{a^2-x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(1/2)*(a^2 - x^2)^(1/2),x)
[Out] int(asin(x/a)^(1/2)*(a^2 - x^2)^(1/2), x)
```

3.457 $\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx$

Optimal. Leaf size=42

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

```
[Out] 2/3*a*arcsin(x/a)^(3/2)*(1-x^2/a^2)^(1/2)/(a^2-x^2)^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcSin[x/a]]/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(3/2))/(3*Sqrt[a^2 - x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx &= \frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{\sqrt{a^2-x^2}}\\
&= \frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 42, normalized size = 1.00

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[ArcSin[x/a]]/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(3/2))/(3*Sqrt[a^2 - x^2])
```

Maple [A]
time = 0.12, size = 38, normalized size = 0.90

method	result	size
default	$\frac{2\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}} a\sqrt{\frac{a^2-x^2}{a^2}}}{3\sqrt{a^2-x^2}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2/3*arcsin(x/a)^(3/2)*a/(a^2-x^2)^(1/2)*((a^2-x^2)/a^2)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [A]
time = 1.79, size = 36, normalized size = 0.86

$$-\frac{2}{3}\sqrt{-\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)}\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="fricas")
```

```
[Out] -2/3*sqrt(-arctan(-x/sqrt(a^2 - x^2)))*arctan(-x/sqrt(a^2 - x^2))
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\sqrt{-\left(-a+x\right)\left(a+x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(1/2),x)
```

```
[Out] Integral(sqrt(asin(x/a))/sqrt(-(-a + x)*(a + x)), x)
```

Giac [**A**]
time = 0.42, size = 15, normalized size = 0.36

$$\frac{2\,|a|\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="giac")
```

```
[Out] 2/3*abs(a)*arcsin(x/a)^(3/2)/a
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(1/2)/(a^2 - x^2)^(1/2),x)
```

```
[Out] int(asin(x/a)^(1/2)/(a^2 - x^2)^(1/2), x)
```

3.458 $\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx$

Optimal. Leaf size=90

$$\frac{x\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{a^2\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\text{Int}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}},x\right)}{2a^3\sqrt{a^2-x^2}}$$

```
[Out] x*arcsin(x/a)^(1/2)/a^2/(a^2-x^2)^(1/2)-1/2*(1-x^2/a^2)^(1/2)*Unintegrable(
x/(1-x^2/a^2)/arcsin(x/a)^(1/2),x)/a^3/(a^2-x^2)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2),x]
```

```
[Out] (x*Sqrt[ArcSin[x/a]])/(a^2*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[Int]
[x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(2*a^3*Sqrt[a^2 - x^2])
```

Rubi steps

$$\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx=\frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{a^2\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{2a^3\sqrt{a^2-x^2}}$$

Mathematica [A]
time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2),x]
```

```
[Out] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2), x]
```

Maple [A]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^{2}-x^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x)
```

```
[Out] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{asin}{\left(\frac{x}{a} \right)}}}{\left(- \left(- a + x\right) \left(a + x\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(3/2),x)
```

```
[Out] Integral(sqrt(asin(x/a))/(-(-a + x)*(a + x))**(3/2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(3/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\mathrm{asin}\left(\frac{x}{a}\right)}}{{\left(a^2-x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(1/2)/(a^2 - x^2)^(3/2),x)
```

```
[Out] int(asin(x/a)^(1/2)/(a^2 - x^2)^(3/2), x)
```

3.459 $\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$

Optimal. Leaf size=185

$$\frac{x\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2x\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{3a^4\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\text{Int}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}},x\right)}{6a^5\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\text{Int}\left(\frac{}{\left(1-\frac{x^2}{a^2}\right)\sqrt{}}\right.}{3a^5\sqrt{a^2-}}$$

```
[Out] 1/3*x*arcsin(x/a)^(1/2)/a^2/(a^2-x^2)^(3/2)+2/3*x*arcsin(x/a)^(1/2)/a^4/(a^
2-x^2)^(1/2)-1/6*(1-x^2/a^2)^(1/2)*Unintegrable(x/(1-x^2/a^2)^2/arcsin(x/a)
^(1/2),x)/a^5/(a^2-x^2)^(1/2)-1/3*(1-x^2/a^2)^(1/2)*Unintegrable(x/(1-x^2/a
^2)/arcsin(x/a)^(1/2),x)/a^5/(a^2-x^2)^(1/2)
```

Rubi [A]

time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2),x]
```

```
[Out] (x*Sqrt[ArcSin[x/a]])/(3*a^2*(a^2 - x^2)^(3/2)) + (2*x*Sqrt[ArcSin[x/a]])/(
3*a^4*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[Int][x/((1 - x^2/a^2)^2*S
qrt[ArcSin[x/a]]), x])/(6*a^5*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[I
nt][x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(3*a^5*Sqrt[a^2 - x^2])
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx &= \frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2\int \frac{\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx}{3a^2}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{6a^5\sqrt{a^2-x^2}} \\
&= \frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{3a^4\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}\,dx}{6a^5\sqrt{a^2-x^2}}-\frac{\sqrt{1-}}{}
\end{aligned}$$

Mathematica [A]
time = 1.22, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2),x]
[Out] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2), x]
```

Maple [A]
time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x)
[Out] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\left(-\left(-a+x\right)\left(a+x\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(5/2),x)
```

```
[Out] Integral(sqrt(asin(x/a))/(-(-a + x)*(a + x))**(5/2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(5/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{{\left(a^2-x^2\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(1/2)/(a^2 - x^2)^(5/2),x)
```

```
[Out] int(asin(x/a)^(1/2)/(a^2 - x^2)^(5/2), x)
```

3.460 $\int (a^2-x^2)^{3/2} \text{ArcSin}\left(\frac{x}{a}\right)^{3/2} \, dx$

Optimal. Leaf size=359

$$\frac{27a^3\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}-\frac{9ax^2\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3(a^2-x^2)^{5/2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2}$$

```
[Out] 1/4*x*(a^2-x^2)^(3/2)*arcsin(x/a)^(3/2)+3/8*a^2*x*arcsin(x/a)^(3/2)*(a^2-x^
2)^(1/2)+3/20*a^3*arcsin(x/a)^(5/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)-3/102
4*a^3*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(x/a)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2-
x^2)^(1/2)/(1-x^2/a^2)^(1/2)-3/32*a^3*FresnelC(2*arcsin(x/a)^(1/2)/Pi^(1/2)
)*Pi^(1/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+3/32*(a^2-x^2)^(5/2)*arcsin(x/
a)^(1/2)/a/(1-x^2/a^2)^(1/2)+27/256*a^3*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)/(
1-x^2/a^2)^(1/2)-9/32*a*x^2*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)/(1-x^2/a^2)^(
1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 359, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {4743, 4741, 4737, 4725, 4809, 3393, 3385, 3433, 4767, 4753}

$$\frac{3}{8}a^2x\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}-\frac{9ax^2\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{4}x(a^2-x^2)^{3/2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}+\frac{3(a^2-x^2)^{5/2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}-\frac{3\sqrt{\frac{\pi}{2}}\,a^3\sqrt{a^2-x^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}\right)}{512\sqrt{1-\frac{x^2}{a^2}}}-\frac{3\sqrt{\pi}\,a^3\sqrt{a^2-x^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3a^3\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}}+\frac{27a^3\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2),x]
```

```
[Out] (27*a^3*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(256*Sqrt[1 - x^2/a^2]) - (9*a*x
^2*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(32*Sqrt[1 - x^2/a^2]) + (3*(a^2 - x^
2)^(5/2)*Sqrt[ArcSin[x/a]])/(32*a*Sqrt[1 - x^2/a^2]) + (3*a^2*x*Sqrt[a^2 -
x^2]*ArcSin[x/a]^(3/2))/8 + (x*(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2))/4 + (3*
a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(20*Sqrt[1 - x^2/a^2]) - (3*a^3*Sqrt
[Pi/2]*Sqrt[a^2 - x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a]]])/(512*Sqrt[
1 - x^2/a^2]) - (3*a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a
]])/Sqrt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
```

```
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \left(a^2-x^2\right)^{3/2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2}\,dx = \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + \frac{1}{4}\left(3a^2\right)\int \sqrt{a^2-x^2}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2}\,dx - \frac{(}{}$$

$$= \frac{3(a^2-x^2)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}} + \frac{3}{8}a^2x\sqrt{a^2-x^2}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + \frac{1}{4}x(a^2-x^2$$

$$= -\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}} + \frac{3}{8}a^2x\sqrt{a^2$$

$$= -\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2)^{5/2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}} + \frac{3}{8}a^2x\sqrt{a^2$$

$$= -\frac{9a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x}{32}$$

$$= \frac{27a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2}{32}$$

$$= \frac{27a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2}{32}$$

$$= \frac{27a^3\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2}{32}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.30, size = 209, normalized size = 0.58

$$\frac{a^3\sqrt{a^2-x^2}\left(-240\sqrt{\pi}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)+\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}\left(5\sqrt{i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{5}{2},-4i\text{ArcSin}\left(\frac{x}{a}\right)\right)+5\sqrt{-i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{5}{2},4i\text{ArcSin}\left(\frac{x}{a}\right)\right)+32\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)^2}\left(12\text{ArcSin}\left(\frac{x}{a}\right)^2+15\cos\left(2\text{ArcSin}\left(\frac{x}{a}\right)\right)+20\text{ArcSin}\left(\frac{x}{a}\right)\sin\left(2\text{ArcSin}\left(\frac{x}{a}\right)\right)\right)\right)\right)}{2560\sqrt{1-\frac{x^2}{a^2}}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2),x]
```

```
[Out] (a^3*Sqrt[a^2 - x^2]*(-240*Sqrt[Pi]*Sqrt[ArcSin[x/a]^2]*FresnelC[(2*Sqrt[Ar
cSin[x/a]])/Sqrt[Pi]] + Sqrt[ArcSin[x/a]]*(5*Sqrt[I*ArcSin[x/a]]*Gamma[5/2,
 (-4*I)*ArcSin[x/a]] + 5*Sqrt[(-I)*ArcSin[x/a]]*Gamma[5/2, (4*I)*ArcSin[x/a
]] + 32*Sqrt[ArcSin[x/a]^2]*(12*ArcSin[x/a]^2 + 15*Cos[2*ArcSin[x/a]] + 20*
ArcSin[x/a]*Sin[2*ArcSin[x/a]]))))/(2560*Sqrt[1 - x^2/a^2]*Sqrt[ArcSin[x/a]
^2])
```

Maple [F]
time = 0.28, size = 0, normalized size = 0.00

$$\int \left(a^2-x^2\right)^{\frac{3}{2}} \arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x)
```

```
[Out] int((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(3/2)*asin(x/a)**(3/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a^2 - x^2)^(3/2)*arcsin(x/a)^(3/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \operatorname{asin}\left(\frac{x}{a}\right)^{3/2}\left(a^2-x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(3/2)*(a^2 - x^2)^(3/2),x)
```

```
[Out] int(asin(x/a)^(3/2)*(a^2 - x^2)^(3/2), x)
```

3.461 $\int \sqrt{a^2-x^2}\, \mathbf{ArcSin}\left(\frac{x}{a}\right)^{3/2}\, dx$

Optimal. Leaf size=215

$$\frac{3a\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{3x^2\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\,\text{Arc}}{5\sqrt{1-}}$$

```
[Out] 1/2*x*arcsin(x/a)^(3/2)*(a^2-x^2)^(1/2)+1/5*a*arcsin(x/a)^(5/2)*(a^2-x^2)^(
1/2)/(1-x^2/a^2)^(1/2)-3/32*a*FresnelC(2*arcsin(x/a)^(1/2)/Pi^(1/2))*Pi^(1/
2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+3/16*a*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/
2)/(1-x^2/a^2)^(1/2)-3/8*x^2*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)/a/(1-x^2/a^2
)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {4741, 4737, 4725, 4809, 3393, 3385, 3433}

$$-\frac{3\sqrt{\pi}\,a\sqrt{a^2-x^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\,\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}-\frac{3x^2\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3a\sqrt{a^2-x^2}\,\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2),x]
```

```
[Out] (3*a*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(16*Sqrt[1 - x^2/a^2]) - (3*x^2*Sqr
t[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(8*a*Sqrt[1 - x^2/a^2]) + (x*Sqrt[a^2 - x^2
]*ArcSin[x/a]^(3/2))/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[1 -
x^2/a^2]) - (3*a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a]])/Sq
rt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \sqrt{a^2-x^2}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2}dx = \frac{1}{2}x\sqrt{a^2-x^2}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + \frac{\sqrt{a^2-x^2}\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{1-\frac{x^2}{a^2}}}dx}{2\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(3\sqrt{a^2-x^2}\right)}{4a\sqrt{}}$$

$$= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{2}x\sqrt{a^2-x^2}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + \frac{a\sqrt{a^2-x^2}}{5\sqrt{1}}$$

$$= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{2}x\sqrt{a^2-x^2}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + \frac{a\sqrt{a^2-x^2}}{5\sqrt{1}}$$

$$= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{2}x\sqrt{a^2-x^2}\,\sin^{-1}\left(\frac{x}{a}\right)^{3/2} + \frac{a\sqrt{a^2-x^2}}{5\sqrt{1}}$$

$$= \frac{3a\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}} - \frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{2}x\sqrt{a^2-x^2}$$

$$= \frac{3a\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}} - \frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{2}x\sqrt{a^2-x^2}$$

$$= \frac{3a\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}} - \frac{3x^2\sqrt{a^2-x^2}\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{2}x\sqrt{a^2-x^2}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.09, size = 173, normalized size = 0.80

$$\frac{\sqrt{a^2-x^2}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}\left(32\text{ArcSin}\left(\frac{x}{a}\right)\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)^2}\left(5x\sqrt{1-\frac{x^2}{a^2}}+2a\text{ArcSin}\left(\frac{x}{a}\right)\right)+15\sqrt{2}\,a\sqrt{i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{3}{2},-2i\text{ArcSin}\left(\frac{x}{a}\right)\right)+15\sqrt{2}\,a\sqrt{-i\text{ArcSin}\left(\frac{x}{a}\right)}\,\text{Gamma}\left(\frac{3}{2},2i\text{ArcSin}\left(\frac{x}{a}\right)\right)\right)}{320\sqrt{1-\frac{x^2}{a^2}}\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2),x]
```

```
[Out] (Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]]*(32*ArcSin[x/a]*Sqrt[ArcSin[x/a]^2]*(5*x
*Sqrt[1 - x^2/a^2] + 2*a*ArcSin[x/a]) + 15*Sqrt[2]*a*Sqrt[I*ArcSin[x/a]]*Ga
mma[3/2, (-2*I)*ArcSin[x/a]] + 15*Sqrt[2]*a*Sqrt[(-I)*ArcSin[x/a]]*Gamma[3/
2, (2*I)*ArcSin[x/a]]))/(320*Sqrt[1 - x^2/a^2]*Sqrt[ArcSin[x/a]^2])
```

Maple [F]
time = 0.41, size = 0, normalized size = 0.00

$$\int \sqrt{a^{2}-x^{2}}\, \arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x)
```

```
[Out] int((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-\left(-a+x\right)\left(a+x\right)}\, \operatorname{asin}^{\frac{3}{2}}\left(\frac{x}{a}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2-x**2)**(1/2)*asin(x/a)**(3/2),x)
```

```
[Out] Integral(sqrt(-(-a + x)*(a + x))*asin(x/a)**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a^2 - x^2)*arcsin(x/a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{asin}\left(\frac{x}{a}\right)^{3/2}\sqrt{a^2-x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(3/2)*(a^2 - x^2)^(1/2),x)
```

```
[Out] int(asin(x/a)^(3/2)*(a^2 - x^2)^(1/2), x)
```

3.462 $\int \frac{\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx$

Optimal. Leaf size=42

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

```
[Out] 2/5*a*arcsin(x/a)^(5/2)*(1-x^2/a^2)^(1/2)/(a^2-x^2)^(1/2)
```

Rubi [A]

time = 0.02, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {4737}

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[x/a]^(3/2)/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[a^2 - x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx &= \frac{\sqrt{1-\frac{x^2}{a^2}}\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{\sqrt{a^2-x^2}}\\ &= \frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\sin^{-1}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 42, normalized size = 1.00

$$\frac{2a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[x/a]^(3/2)/Sqrt[a^2 - x^2],x]
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[a^2 - x^2])
```

Maple [A]
time = 0.10, size = 38, normalized size = 0.90

method	result	size
default	$\frac{2\arcsin\left(\frac{x}{a}\right)^{\frac{5}{2}} a\sqrt{\frac{a^2-x^2}{a^2}}}{5\sqrt{a^2-x^2}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/5*arcsin(x/a)^(5/2)*a/(a^2-x^2)^(1/2)*((a^2-x^2)/a^2)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [A]
time = 2.09, size = 38, normalized size = 0.90

$$\frac{2}{5}\sqrt{-\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)}\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="fricas")
```

[Out] 2/5*sqrt(-arctan(-x/sqrt(a^2 - x^2)))*arctan(-x/sqrt(a^2 - x^2))^2

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{\frac{3}{2}}\left(\frac{x}{a}\right)}{\sqrt{-\left(-a+x\right)\left(a+x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(3/2)/(a**2-x**2)**(1/2),x)
```

```
[Out] Integral(asin(x/a)**(3/2)/sqrt(-(-a + x)*(a + x)), x)
```

Giac [A]
time = 0.41, size = 15, normalized size = 0.36

$$\frac{2\left|a\right|\arcsin\left(\frac{x}{a}\right)^{\frac{5}{2}}}{5\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="giac")
```

```
[Out] 2/5*abs(a)*arcsin(x/a)^(5/2)/a
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\operatorname{asin}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(3/2)/(a^2 - x^2)^(1/2),x)
```

```
[Out] int(asin(x/a)^(3/2)/(a^2 - x^2)^(1/2), x)
```

3.463 $\int \frac{\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$

Optimal. Leaf size=90

$$\frac{x\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{a^2\sqrt{a^2-x^2}}-\frac{3\sqrt{1-\frac{x^2}{a^2}}\,\text{Int}\left(\frac{x\sqrt{\text{ArcSin}\left(\frac{x}{a}\right)}}{1-\frac{x^2}{a^2}},x\right)}{2a^3\sqrt{a^2-x^2}}$$

[Out] x*arcsin(x/a)^(3/2)/a^2/(a^2-x^2)^(1/2)-3/2*(1-x^2/a^2)^(1/2)*Unintegrable(x*arcsin(x/a)^(1/2)/(1-x^2/a^2),x)/a^3/(a^2-x^2)^(1/2)

Rubi [A]
time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}=0.000$, Rules used = {}

$$\int \frac{\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

Verification is not applicable to the result.

[In] Int[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2),x]

[Out] (x*ArcSin[x/a]^(3/2))/(a^2*Sqrt[a^2 - x^2]) - (3*Sqrt[1 - x^2/a^2]*Defer[Int][(x*Sqrt[ArcSin[x/a]])/(1 - x^2/a^2), x])/(2*a^3*Sqrt[a^2 - x^2])

Rubi steps

$$\int \frac{\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx=\frac{x\sin^{-1}\left(\frac{x}{a}\right)^{3/2}}{a^2\sqrt{a^2-x^2}}-\frac{\left(3\sqrt{1-\frac{x^2}{a^2}}\right)\int \frac{x\sqrt{\sin^{-1}\left(\frac{x}{a}\right)}}{1-\frac{x^2}{a^2}}\,dx}{2a^3\sqrt{a^2-x^2}}$$

Mathematica [A]
time = 0.49, size = 0, normalized size = 0.00

$$\int \frac{\text{ArcSin}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2),x]
```

```
[Out] Integrate[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2), x]
```

Maple [A]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{\left(a^{2}-x^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x)
```

```
[Out] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{\frac{3}{2}}\left(\frac{x}{a}\right)}{\left(-\left(-a+x\right)\left(a+x\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(x/a)**(3/2)/(a**2-x**2)**(3/2),x)
```

```
[Out] Integral(asin(x/a)**(3/2)/(-(-a + x)*(a + x))**(3/2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="giac")
[Out] integrate(arcsin(x/a)^(3/2)/(a^2 - x^2)^(3/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{asin}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(x/a)^(3/2)/(a^2 - x^2)^(3/2),x)
[Out] int(asin(x/a)^(3/2)/(a^2 - x^2)^(3/2), x)
```

3.464 $\int \frac{x}{\sqrt{1-x^2}\sqrt{\mathbf{ArcSin}(x)}}\,dx$

Optimal. Leaf size=25

$$\sqrt{2\pi}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\mathrm{ArcSin}(x)}\right)$$

```
[Out] FresnelS(2^(1/2)/Pi^(1/2)*arcsin(x)^(1/2))*2^(1/2)*Pi^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {4809, 3386, 3432}

$$\sqrt{2\pi}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\mathrm{ArcSin}(x)}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/(Sqrt[1 - x^2]*Sqrt[ArcSin[x]]),x]
```

```
[Out] Sqrt[2*Pi]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcSin[x]]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\sin^{-1}(x)}}\,dx = \text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(x)\right)$$
$$= 2\text{Subst}\left(\int \sin\left(x^2\right)\,dx, x, \sqrt{\sin^{-1}(x)}\right)$$
$$= \sqrt{2\pi}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(x)}\right)$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.05, size = 53, normalized size = 2.12

$$-\frac{\sqrt{-i\text{ArcSin}(x)}\,\text{Gamma}\left(\frac{1}{2},-i\text{ArcSin}(x)\right)+\sqrt{i\text{ArcSin}(x)}\,\text{Gamma}\left(\frac{1}{2},i\text{ArcSin}(x)\right)}{2\sqrt{\text{ArcSin}(x)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(Sqrt[1 - x^2]*Sqrt[ArcSin[x]]),x]
```

```
[Out] -1/2*(Sqrt[(-I)*ArcSin[x]]*Gamma[1/2, (-I)*ArcSin[x]] + Sqrt[I*ArcSin[x]]*G
amma[1/2, I*ArcSin[x]])/Sqrt[ArcSin[x]]
```

Maple [A]
time = 0.29, size = 20, normalized size = 0.80

method	result	size
default	$\mathrm{S}\left(\frac{\sqrt{2}\,\sqrt{\arcsin\left(x\right)}}{\sqrt{\pi}}\right)\sqrt{2}\,\sqrt{\pi}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] FresnelS(2^(1/2)/Pi^(1/2)*arcsin(x)^(1/2))*2^(1/2)*Pi^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{-(x-1)(x+1)}\sqrt{\operatorname{asin}(x)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x**2+1)**(1/2)/asin(x)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(-(x - 1)*(x + 1))*sqrt(asin(x))), x)
```

Giac [C] Result contains complex when optimal does not.
time = 0.42, size = 37, normalized size = 1.48

$$\left(\frac{1}{4}i-\frac{1}{4}\right)\sqrt{2}\sqrt{\pi}\operatorname{erf}\left(\left(\frac{1}{2}i-\frac{1}{2}\right)\sqrt{2}\sqrt{\arcsin(x)}\right)-\left(\frac{1}{4}i+\frac{1}{4}\right)\sqrt{2}\sqrt{\pi}\operatorname{erf}\left(-\left(\frac{1}{2}i+\frac{1}{2}\right)\sqrt{2}\sqrt{\arcsin(x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="giac")
```

```
[Out] (1/4*I - 1/4)*sqrt(2)*sqrt(pi)*erf((1/2*I - 1/2)*sqrt(2)*sqrt(arcsin(x))) -
 (1/4*I + 1/4)*sqrt(2)*sqrt(pi)*erf(-(1/2*I + 1/2)*sqrt(2)*sqrt(arcsin(x)))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\sqrt{\operatorname{asin}(x)}\sqrt{1-x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(asin(x)^(1/2)*(1 - x^2)^(1/2)),x)
```

```
[Out] int(x/(asin(x)^(1/2)*(1 - x^2)^(1/2)), x)
```

3.465 $\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\textbf{ArcSin}(ax)}}\,dx$

Optimal. Leaf size=244

$$\frac{5c^2\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}}{8a\sqrt{1-a^2x^2}}+\frac{3c^2\sqrt{\frac{\pi}{2}}\,\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{16a\sqrt{1-a^2x^2}}+\frac{c^2\sqrt{\frac{\pi}{3}}\,\sqrt{c-a^2cx}}{}$$

```
[Out] 1/96*c^2*(-a^2*c*x^2+c)^(1/2)*FresnelC(2*3^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2)
)*3^(1/2)*Pi^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/32*c^2*(-a^2*c*x^2+c)^(1/2)*Fresn
elC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a/(-a^2*x^2+1)^(
1/2)+15/32*c^2*(-a^2*c*x^2+c)^(1/2)*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*
Pi^(1/2)/a/(-a^2*x^2+1)^(1/2)+5/8*c^2*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2
)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.11, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4753, 3393, 3385, 3433}

$$\frac{3\sqrt{\frac{\pi}{2}}\,c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{16a\sqrt{1-a^2x^2}}+\frac{\sqrt{\frac{\pi}{3}}\,c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{3}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{32a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}\,c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{5c^2\sqrt{\text{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}}{8a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(5/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (5*c^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*a*Sqrt[1 - a^2*x^2]) + (3*
c^2*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]]
)/(16*a*Sqrt[1 - a^2*x^2]) + (c^2*Sqrt[Pi/3]*Sqrt[c - a^2*c*x^2]*FresnelC[2
*Sqrt[3/Pi]*Sqrt[ArcSin[a*x]]])/(32*a*Sqrt[1 - a^2*x^2]) + (15*c^2*Sqrt[Pi]
*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1
 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\sin^{-1}(ax)}}\,dx = \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\int \frac{(1-a^2x^2)^{5/2}}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \frac{\cos^6(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \left(\frac{5}{16\sqrt{x}}+\frac{15\cos(2x)}{32\sqrt{x}}+\frac{3\cos(4x)}{16\sqrt{x}}+\frac{\cos(6x)}{32\sqrt{x}}\right)dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8a\sqrt{1-a^2x^2}} + \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \frac{\cos(6x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{32a\sqrt{1-a^2x^2}} +$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8a\sqrt{1-a^2x^2}} + \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \cos\left(6x^2\right)dx, x, \sqrt{\sin^{-1}(a}\right.}{16a\sqrt{1-a^2x^2}}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{8a\sqrt{1-a^2x^2}} + \frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{16a\sqrt{1-a^2x^2}} + \frac{c^2\sqrt{}}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.44, size = 336, normalized size = 1.38

$$\frac{c^2\sqrt{c-a^2cx^2}\left(240\mathrm{ArcSin}(ax)\sqrt{\mathrm{ArcSin}(ax)^2}+3i\sqrt{2}\left(16(i\mathrm{ArcSin}(ax))^{3/2}+\sqrt{-i\mathrm{ArcSin}(ax)}\sqrt{\mathrm{ArcSin}(ax)^2}\right)\mathrm{Gamma}\left(\frac{1}{2},-2i\mathrm{ArcSin}(ax)\right)-45i\sqrt{2}(-i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},2i\mathrm{ArcSin}(ax)\right)+24i(i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},-4i\mathrm{ArcSin}(ax)\right)+6i\sqrt{-i\mathrm{ArcSin}(ax)}\sqrt{\mathrm{ArcSin}(ax)^2}\mathrm{Gamma}\left(\frac{1}{2},-4i\mathrm{ArcSin}(ax)\right)-18i(-i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},4i\mathrm{ArcSin}(ax)\right)-i\sqrt{6}\sqrt{-i\mathrm{ArcSin}(ax)}\sqrt{\mathrm{ArcSin}(ax)^2}\mathrm{Gamma}\left(\frac{1}{2},-6i\mathrm{ArcSin}(ax)\right)-i\sqrt{6}(-i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},6i\mathrm{ArcSin}(ax)\right)\right)}{384a\sqrt{1-a^2x^2}\sqrt{\mathrm{ArcSin}(ax)}\sqrt{\mathrm{ArcSin}(ax)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c^2*Sqrt[c - a^2*c*x^2]*(240*ArcSin[a*x]*Sqrt[ArcSin[a*x]^2] + (3*I)*Sqrt[
2]*(16*(I*ArcSin[a*x])^(3/2) + Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2])*
Gamma[1/2, (-2*I)*ArcSin[a*x]] - (45*I)*Sqrt[2]*((-I)*ArcSin[a*x])^(3/2)*Ga
mma[1/2, (2*I)*ArcSin[a*x]] + (24*I)*(I*ArcSin[a*x])^(3/2)*Gamma[1/2, (-4*I
)*ArcSin[a*x]] + (6*I)*Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2]*Gamma[1/2
, (-4*I)*ArcSin[a*x]] - (18*I)*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (4*I)*Ar
cSin[a*x]] - I*Sqrt[6]*Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2]*Gamma[1/2
, (-6*I)*ArcSin[a*x]] - I*Sqrt[6]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (6*I)
*ArcSin[a*x]]))/(384*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]]*Sqrt[ArcSin[a*x]
^2])
```

Maple [F]
time = 0.32, size = 0, normalized size = 0.00

$$\int \frac{\left(-a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{\sqrt{\arcsin \left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(5/2)/asin(a*x)**(1/2),x)
[Out] Exception raised: SystemError >> excessive stack use: stack is 3004 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(5/2)/sqrt(arcsin(a*x)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(c-a^2\,c\,x^2\right)^{5/2}}{\sqrt{\mathrm{asin}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(1/2),x)
[Out] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(1/2), x)
```

3.466 $\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\mathbf{ArcSin}(ax)}}\,dx$

Optimal. Leaf size=170

$$\frac{3c\sqrt{c-a^2cx^2}\,\sqrt{\mathrm{ArcSin}(ax)}}{4a\sqrt{1-a^2x^2}}+\frac{c\sqrt{\frac{\pi}{2}}\,\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\mathrm{ArcSin}(ax)}\right)}{8a\sqrt{1-a^2x^2}}+\frac{c\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,\mathrm{Fr}}{2a\sqrt{}}$$

```
[Out] 1/16*c*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^
2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+1/2*c*FresnelC(2*arcsin(a*x)^(1/2)/Pi
^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/4*c*(-a^2*c*x^
2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4753, 3393, 3385, 3433}

$$\frac{\sqrt{\frac{\pi}{2}}\,c\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\mathrm{ArcSin}(ax)}\right)}{8a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}\,c\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(\frac{2\sqrt{\mathrm{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}+\frac{3c\sqrt{\mathrm{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}}{4a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (3*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(4*a*Sqrt[1 - a^2*x^2]) + (c*Sq
rt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(8*a
*Sqrt[1 - a^2*x^2]) + (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcS
in[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\sin^{-1}(ax)}}\,dx = \frac{\left(c\sqrt{c-a^2cx^2}\right)\int \frac{(1-a^2x^2)^{3/2}}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}} + \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{8a\sqrt{1-a^2x^2}} + \cdots$$

$$= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}} + \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \cos\left(4x^2\right)dx, x, \sqrt{\sin^{-1}(ax)}\right)}{4a\sqrt{1-a^2x^2}} \cdots$$

$$= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{4a\sqrt{1-a^2x^2}} + \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{8a\sqrt{1-a^2x^2}} + \frac{c\sqrt{\pi}\cdots}{\cdots}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.21, size = 182, normalized size = 1.07

$$\frac{c\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(ax)}\left(24\sqrt{\text{ArcSin}(ax)^2}-4\sqrt{2}\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},-2i\text{ArcSin}(ax)\right)-4\sqrt{2}\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},2i\text{ArcSin}(ax)\right)-\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},-4i\text{ArcSin}(ax)\right)-\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},4i\text{ArcSin}(ax)\right)\right)}{32a\sqrt{1-a^2x^2}\sqrt{\text{ArcSin}(ax)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]*(24*Sqrt[ArcSin[a*x]^2] - 4*Sqrt[2
]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] - 4*Sqrt[2]*Sqrt[(-I)*
ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[a*x]] - Sqrt[I*ArcSin[a*x]]*Gamma[1/2,
 (-4*I)*ArcSin[a*x]] - Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (4*I)*ArcSin[a*x]]
))/(32*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]^2])
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{(-a^2 c\, x^2 + c)^{\frac{3}{2}}}{\sqrt{\arcsin(ax)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-c(ax-1)(ax+1))^{\frac{3}{2}}}{\sqrt{\operatorname{asin}(ax)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(1/2),x)
```

```
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/sqrt(asin(a*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/sqrt(arcsin(a*x)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(c-a^2\,c\,x^2\right)}^{3/2}}{\sqrt{\mathrm{asin}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(1/2),x)
```

```
[Out] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(1/2), x)
```

3.467 $\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\text{ArcSin}(ax)}}\,dx$

Optimal. Leaf size=99

$$\frac{\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}$$

```
[Out] 1/2*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/
(-a^2*x^2+1)^(1/2)+(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1
/2)
```

Rubi [A]
time = 0.06, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4753, 3393, 3385, 3433}

$$\frac{\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}+\frac{\sqrt{\text{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}}{a\sqrt{1-a^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[1 - a^2*x^2]) + (Sqrt[Pi]*S
qrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 -
a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\sin^{-1}(ax)}}\,dx &= \frac{\sqrt{c-a^2cx^2}\int \frac{\sqrt{1-a^2x^2}}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}\right)\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{2a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \cos\left(2x^2\right)\,dx, x, \sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,C\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}
\end{aligned}
$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.10, size = 118, normalized size = 1.19

$$
\frac{\sqrt{c(1-a^2x^2)}\left(8\text{ArcSin}(ax)-i\sqrt{2}\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},-2i\text{ArcSin}(ax)\right)+i\sqrt{2}\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},2i\text{ArcSin}(ax)\right)\right)}{8a\sqrt{1-a^2x^2}\sqrt{\text{ArcSin}(ax)}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (Sqrt[c*(1 - a^2*x^2)]*(8*ArcSin[a*x] - I*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Ga
mma[1/2, (-2*I)*ArcSin[a*x]] + I*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*
I)*ArcSin[a*x]]))/(8*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-a^{2} c \,x^{2}+c}}{\sqrt{\arcsin \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x)
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{- c \left(a x - 1\right) \left(a x + 1\right)}}{\sqrt{\operatorname{asin}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(1/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/sqrt(asin(a*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-a^2*c*x^2 + c)/sqrt(arcsin(a*x)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{c-a^2\,c\,x^2}}{\sqrt{\mathrm{asin}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(1/2),x)
[Out] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(1/2), x)
```

3.468 $\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}(ax)}}\,dx$

Optimal. Leaf size=42

$$\frac{2\sqrt{1-a^2x^2}\sqrt{\text{ArcSin}(ax)}}{a\sqrt{c-a^2cx^2}}$$

```
[Out] 2*(-a^2*x^2+1)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {4737}

$$\frac{2\sqrt{1-a^2x^2}\sqrt{\text{ArcSin}(ax)}}{a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\sin^{-1}(ax)}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{1}{\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{c-a^2cx^2}}\\
&= \frac{2\sqrt{1-a^2x^2}\sqrt{\sin^{-1}(ax)}}{a\sqrt{c-a^2cx^2}}
\end{aligned}$$

Mathematica [A]
time = 0.03, size = 42, normalized size = 1.00

$$\frac{2\sqrt{1-a^2x^2}\sqrt{\text{ArcSin}(ax)}}{a\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]),x]
[Out] (2*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[c - a^2*c*x^2])
```

Maple [A]
time = 0.11, size = 38, normalized size = 0.90

method	result	size
default	$\frac{2\sqrt{\arcsin\left(ax\right)}\,\sqrt{-a^{2}x^{2}+1}}{a\sqrt{-c\left(a^{2}x^{2}-1\right)}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*arcsin(a*x)^(1/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{-c\left(ax-1\right)\left(ax+1\right)}\,\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*sqrt(asin(a*x))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*sqrt(arcsin(a*x))), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\sqrt{\mathrm{asin}\left(a\,x\right)}\,\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2)), x)
```

3.469 $\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\text{ArcSin}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\text{ArcSin}(ax)}},x\right)$$

```
[Out] Unintegrable(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\text{ArcSin}(ax)}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]),x]
[Out] Defer[Int][1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\sin^{-1}(ax)}}\,dx = \int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Mathematica [A]
time = 0.61, size = 0, normalized size = 0.00

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\text{ArcSin}(ax)}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]),x]
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]), x]
```

Maple [A]
time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{1}{(-a^2c\,x^2+c)^{\frac{3}{2}}\sqrt{\arcsin(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(1/2),x)
```

```
[Out] Integral(1/((-c*(a*x - 1)*(a*x + 1))**(3/2)*sqrt(asin(a*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*sqrt(arcsin(a*x))), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\sqrt{\mathrm{asin}\left(a\,x\right)}\,{\left(c-a^2\,c\,x^2\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2)),x)
[Out] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2)), x)
```

3.470 $\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\mathbf{ArcSin}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\text{ArcSin}(ax)}},x\right)$$

[Out] Unintegrable(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\text{ArcSin}(ax)}}\,dx$$

Verification is not applicable to the result.

[In] Int[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]),x]

[Out] Defer[Int][1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]), x]

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}\,dx=\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}\,dx$$

Mathematica [A]
time = 1.41, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sqrt{\text{ArcSin}(ax)}}\,dx$$

Verification is not applicable to the result.

[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]),x]

[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]), x]

Maple [A]
time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}\sqrt{\arcsin\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{5}{2}}\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(1/2),x)
```

```
[Out] Integral(1/((-c*(a*x - 1)*(a*x + 1))**(5/2)*sqrt(asin(a*x))), x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*sqrt(arcsin(a*x))), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\sqrt{\mathrm{asin}\left(a\,x\right)}\,{\left(c-a^2\,c\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(5/2)),x)
[Out] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(5/2)), x)
```

3.471 $\int \frac{(c-a^2cx^2)^{5/2}}{\mathbf{ArcSin}(ax)^{3/2}}\,dx$

Optimal. Leaf size=237

$$-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\text{ArcSin}(ax)}}-\frac{3c^2\sqrt{\frac{\pi}{2}}\,\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{2a\sqrt{1-a^2x^2}}-\frac{c^2\sqrt{3\pi}\,\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\cdots}\right.}{8a\sqrt{1-a^2\cdots}}$$

```
[Out] -3/4*c^2*FresnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-
a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-15/8*c^2*FresnelS(2*arcsin(a*x)^(1/
2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/8*c^2*Fre
snelS(2*3^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*3^(1/2)*Pi^(1/2)*(-a^2*c*x^2+c)
^(1/2)/a/(-a^2*x^2+1)^(1/2)-2*(-a^2*c*x^2+c)^(5/2)*(-a^2*x^2+1)^(1/2)/a/arc
sin(a*x)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4751, 4809, 4491, 3386, 3432}

$$-\frac{3\sqrt{\frac{\pi}{2}}\,c^2\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{2a\sqrt{1-a^2x^2}}-\frac{\sqrt{3\pi}\,c^2\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{3}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{8a\sqrt{1-a^2x^2}}-\frac{15\sqrt{\pi}\,c^2\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(5/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(5/2))/(a*Sqrt[ArcSin[a*x]]) - (3*c^2
*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(
2*a*Sqrt[1 - a^2*x^2]) - (c^2*Sqrt[3*Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqr
t[3/Pi]*Sqrt[ArcSin[a*x]]])/(8*a*Sqrt[1 - a^2*x^2]) - (15*c^2*Sqrt[Pi]*Sqrt
[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2
*x^2])
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sin^{-1}(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(12ac^2\sqrt{c-a^2cx^2}\right)\int \frac{x(1-a^2x^2)^2}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(12c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^5(x)\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(\right.}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(12c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{5\sin(2x)}{32\sqrt{x}} + \frac{\sin(4x)}{8\sqrt{x}} + \frac{\sin(}{32\sqrt{}}\right.\right.}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(6x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{8a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin(6x^2)\,dx, x, \sqrt{\sin^{-1}(\right.}{4a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{5/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{2a\sqrt{1-a^2x^2}} - \frac{c^2\sqrt{}}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.73, size = 404, normalized size = 1.70

$$-\frac{c^2e^{-6i\text{ArcSin}(ax)}\sqrt{c-a^2cx^2}\left(1+6e^{2i\text{ArcSin}(ax)}+15e^{4i\text{ArcSin}(ax)}+20e^{6i\text{ArcSin}(ax)}+15e^{8i\text{ArcSin}(ax)}+6e^{10i\text{ArcSin}(ax)}+e^{12i\text{ArcSin}(ax)}+64e^{6i\text{ArcSin}(ax)}\sqrt{\pi}\sqrt{\text{ArcSin}(ax)}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)+\sqrt{2}e^{6i\text{ArcSin}(ax)}\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},-2i\text{ArcSin}(ax)\right)+\sqrt{2}e^{6i\text{ArcSin}(ax)}\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},2i\text{ArcSin}(ax)\right)-12e^{6i\text{ArcSin}(ax)}\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},-4i\text{ArcSin}(ax)\right)-12e^{6i\text{ArcSin}(ax)}\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},4i\text{ArcSin}(ax)\right)-\sqrt{6}e^{6i\text{ArcSin}(ax)}\sqrt{-i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},-6i\text{ArcSin}(ax)\right)-\sqrt{6}e^{6i\text{ArcSin}(ax)}\sqrt{i\text{ArcSin}(ax)}\,\text{Gamma}\left(\frac{1}{2},6i\text{ArcSin}(ax)\right)\right)}{32a\sqrt{1-a^2x^2}\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] -1/32*(c^2*Sqrt[c - a^2*c*x^2]*(1 + 6*E^((2*I)*ArcSin[a*x]) + 15*E^((4*I)*A
rcSin[a*x]) + 20*E^((6*I)*ArcSin[a*x]) + 15*E^((8*I)*ArcSin[a*x]) + 6*E^((1
0*I)*ArcSin[a*x]) + E^((12*I)*ArcSin[a*x]) + 64*E^((6*I)*ArcSin[a*x])*Sqrt[
Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]] + Sqrt[2]*E^
((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] +
 Sqrt[2]*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[
a*x]] - 12*E^((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-4*I)*A
```

```
rcSin[a*x]] - 12*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (4*I)
*ArcSin[a*x]] - Sqrt[6]*E^((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[
1/2, (-6*I)*ArcSin[a*x]] - Sqrt[6]*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]
]*Gamma[1/2, (6*I)*ArcSin[a*x]]))/(a*E^((6*I)*ArcSin[a*x])*Sqrt[1 - a^2*x^2
]*Sqrt[ArcSin[a*x]])
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{\left(-a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{\arcsin \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
[Out] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(5/2)/asin(a*x)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3004 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(5/2)/arcsin(a*x)^(3/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(c-a^2\,c\,x^2\right)^{5/2}}{{\mathrm{asin}\left(a\,x\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(3/2),x)
[Out] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(3/2), x)
```

3.472 $\int \frac{(c-a^2cx^2)^{3/2}}{\text{ArcSin}(ax)^{3/2}}\,dx$

Optimal. Leaf size=163

$$-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\text{ArcSin}(ax)}}-\frac{c\sqrt{\frac{\pi}{2}}\,\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{a\sqrt{1-a^2x^2}}-\frac{2c\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\text{Ar}}}{}\right.}{a\sqrt{1-a^2x^2}}$$

```
[Out] -1/2*c*FresnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^
2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-2*c*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(
1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-2*(-a^2*c*x^2+c)^(
3/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*x)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4751, 4809, 4491, 3386, 3432}

$$-\frac{\sqrt{\frac{\pi}{2}}\,c\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{\pi}\,c\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(a*Sqrt[ArcSin[a*x]]) - (c*Sqr
t[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(a*Sq
rt[1 - a^2*x^2]) - (2*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSi
n[a*x]])/Sqrt[Pi]])/(a*Sqrt[1 - a^2*x^2])
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sin^{-1}(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(8ac\sqrt{c-a^2cx^2}\right)\int \frac{x(1-a^2x^2)}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(a\right.}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \left(\frac{\sin(2x)}{4\sqrt{x}}+\frac{\sin(4x)}{8\sqrt{x}}\right)dx, x,\right.}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}} -$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(2c\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int \sin\left(4x^2\right)dx, x, \sqrt{\sin^{-1}(\right.}}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}} - \frac{2c\sqrt{}}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.26, size = 211, normalized size = 1.29

$$-\frac{ce^{-4i\mathrm{ArcSin}(ax)}\sqrt{c-a^2cx^2}\left(1+6e^{4i\mathrm{ArcSin}(ax)}+e^{8i\mathrm{ArcSin}(ax)}+8e^{4i\mathrm{ArcSin}(ax)}\cos(2\mathrm{ArcSin}(ax))+16e^{4i\mathrm{ArcSin}(ax)}\sqrt{\pi}\sqrt{\mathrm{ArcSin}(ax)}\,S\left(\frac{2\sqrt{\mathrm{ArcSin}(ax)}}{\sqrt{\pi}}\right)-2e^{4i\mathrm{ArcSin}(ax)}\sqrt{-i\mathrm{ArcSin}(ax)}\,\mathrm{Gamma}\left(\frac{1}{2},-4i\mathrm{ArcSin}(ax)\right)-2e^{4i\mathrm{ArcSin}(ax)}\sqrt{i\mathrm{ArcSin}(ax)}\,\mathrm{Gamma}\left(\frac{1}{2},4i\mathrm{ArcSin}(ax)\right)\right)}{8a\sqrt{1-a^2x^2}\sqrt{\mathrm{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] -1/8*(c*Sqrt[c - a^2*c*x^2]*(1 + 6*E^((4*I)*ArcSin[a*x]) + E^((8*I)*ArcSin[
a*x]) + 8*E^((4*I)*ArcSin[a*x])*Cos[2*ArcSin[a*x]] + 16*E^((4*I)*ArcSin[a*x
])*Sqrt[Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]] - 2*
E^((4*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-4*I)*ArcSin[a*x]]
 - 2*E^((4*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (4*I)*ArcSin[a*x]
]))/(a*E^((4*I)*ArcSin[a*x])*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]
time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{\left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{\arcsin \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(- c \left(a x - 1\right) \left(a x + 1\right)\right)^{\frac{3}{2}}}{\operatorname{asin}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(3/2),x)
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/asin(a*x)**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/arcsin(a*x)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(c-a^2\,c\,x^2\right)^{3/2}}{\mathrm{asin}\left(a\,x\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(3/2),x)
[Out] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(3/2), x)
```

3.473 $\int \frac{\sqrt{c-a^2cx^2}}{\mathbf{ArcSin}(ax)^{3/2}}\,dx$

Optimal. Leaf size=98

$$-\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\mathrm{ArcSin}(ax)}}-\frac{2\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\mathrm{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}$$

```
[Out] -2*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(
-a^2*x^2+1)^(1/2)-2*(-a^2*c*x^2+c)^(1/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*x)^(
1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4751, 4731, 4491, 12, 3386, 3432}

$$-\frac{2\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\mathrm{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\mathrm{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(3/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(a*Sqrt[ArcSin[a*x]]) - (2*Sqrt[
Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(a*Sqrt[1
 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{c-a^2cx^2}}{\sin^{-1}(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4a\sqrt{c-a^2cx^2}\right)\int \frac{x}{\sqrt{\sin^{-1}(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \sin^{-1}(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\sin^{-1}(ax)}\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{a\sqrt{\sin^{-1}(ax)}} - \frac{2\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,S\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}$$

Mathematica [A]
time = 0.11, size = 83, normalized size = 0.85

$$-\frac{\sqrt{c\left(1-a^2x^2\right)}\left(1+\cos(2\text{ArcSin}(ax))+2\sqrt{\pi}\,\sqrt{\text{ArcSin}(ax)}\,S\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)\right)}{a\sqrt{1-a^2x^2}\,\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(3/2),x]
```

```
[Out] -((Sqrt[c*(1 - a^2*x^2)]*(1 + Cos[2*ArcSin[a*x]] + 2*Sqrt[Pi]*Sqrt[ArcSin[a
*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]]))/(a*Sqrt[1 - a^2*x^2]*Sqrt[A
rcSin[a*x]]))
```

Maple [F]

time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-a^2 c\,x^2+c}}{\arcsin(ax)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x)
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c(ax-1)(ax+1)}}{\operatorname{asin}^{\frac{3}{2}}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(3/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/asin(a*x)**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)/arcsin(a*x)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{c-a^2\,c\,x^2}}{{\mathrm{asin}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(3/2),x)
```

```
[Out] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(3/2), x)
```

3.474 $\int \frac{1}{\sqrt{c-a^2cx^2}\,\mathbf{ArcSin}(ax)^{3/2}}\,dx$

Optimal. Leaf size=42

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}}$$

```
[Out] -2*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {4737}

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{\text{ArcSin}(ax)}\,\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{1}{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^{3/2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= -\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\,\sqrt{\sin^{-1}(ax)}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 42, normalized size = 1.00

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\,\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [A]
time = 0.10, size = 38, normalized size = 0.90

method	result	size
default	$-\frac{2\sqrt{-a^{2}x^{2}+1}}{\sqrt{\arcsin\left(ax\right)}\, a\sqrt{-c\left(a^{2}x^{2}-1\right)}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/arcsin(a*x)^(1/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [A]
time = 2.07, size = 48, normalized size = 1.14

$$\frac{2\sqrt{-a^{2}cx^{2}+c}\,\sqrt{-a^{2}x^{2}+1}}{\left(a^{3}cx^{2}-ac\right)\sqrt{\arcsin\left(ax\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] 2*sqrt(-a^2*c*x^2 + c)*sqrt(-a^2*x^2 + 1)/((a^3*c*x^2 - a*c)*sqrt(arcsin(a*
x)))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{-c\left(ax-1\right)\left(ax+1\right)}\;\operatorname{asin}^{\frac{3}{2}}\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(3/2),x)
```

```
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\mathrm{asin}\left(a\,x\right)^{3/2}\,\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2)), x)
```

3.475 $\int \frac{1}{(c-a^2cx^2)^{3/2}\mathbf{ArcSin}(ax)^{3/2}}\,dx$

Optimal. Leaf size=103

$$-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{3/2}\sqrt{\text{ArcSin}(ax)}}+\frac{4a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x}{(1-a^2x^2)^2\sqrt{\text{ArcSin}(ax)}},x\right)}{c\sqrt{c-a^2cx^2}}$$

```
[Out] -2*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2)+4*a*(-a^2*x^
2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^2/arcsin(a*x)^(1/2),x)/c/(-a^2*c*x^2
+c)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\text{ArcSin}(ax)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]) + (4*a*S
qrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^2*Sqrt[ArcSin[a*x]]), x])/(c*S
qrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{3/2}\sqrt{\sin^{-1}(ax)}}+\frac{\left(4a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^2\sqrt{\sin^{-1}(ax)}}}{c\sqrt{c-a^2cx^2}}$$

Mathematica [A]
time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\text{ArcSin}(ax)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)), x]
```

Maple [A]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arcsin \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(- c \left(a x - 1\right) \left(a x + 1\right)\right)^{\frac{3}{2}} \operatorname{asin}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(3/2),x)
[Out] Integral(1/((-c*(a*x - 1)*(a*x + 1))**(3/2)*asin(a*x)**(3/2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(3/2)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\operatorname{asin}(a\,x)^{3/2}\,\left(c-a^2\,c\,x^2\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2)),x)
[Out] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2)), x)
```

3.476 $\int \frac{1}{(c-a^2cx^2)^{5/2}\textbf{ArcSin}(ax)^{3/2}}\,dx$

Optimal. Leaf size=103

$$-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{5/2}\sqrt{\text{ArcSin}(ax)}}+\frac{8a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x}{(1-a^2x^2)^3\sqrt{\text{ArcSin}(ax)}},x\right)}{c^2\sqrt{c-a^2cx^2}}$$

```
[Out] -2*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2)+8*a*(-a^2*x^
2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^3/arcsin(a*x)^(1/2),x)/c^2/(-a^2*c*x
^2+c)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\text{ArcSin}(ax)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]) + (8*a*S
qrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^3*Sqrt[ArcSin[a*x]]), x])/(c^2
*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^{3/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{a\left(c-a^2cx^2\right)^{5/2}\sqrt{\sin^{-1}(ax)}}+\frac{\left(8a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^3\sqrt{\sin^{-1}(ax)}}}{c^2\sqrt{c-a^2cx^2}}$$

Mathematica [A]
time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\text{ArcSin}(ax)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)), x]
```

Maple [A]
time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arcsin\left(a x\right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3005 deep
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^(3/2)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{asin}\left(a\,x\right)^{3/2}\,{\left(c-a^2\,c\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(5/2)),x)
[Out] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(5/2)), x)
```

3.477 $\int \frac{(c-a^2cx^2)^{3/2}}{\textbf{ArcSin}(ax)^{5/2}}\,dx$

Optimal. Leaf size=206

$$-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\text{ArcSin}(ax)^{3/2}}+\frac{16cx(1-a^2x^2)\,\sqrt{c-a^2cx^2}}{3\sqrt{\text{ArcSin}(ax)}}-\frac{4c\sqrt{2\pi}\,\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}\right.}{3a\sqrt{1-a^2x^2}}$$

```
[Out] -2/3*(-a^2*c*x^2+c)^(3/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*x)^(3/2)-8/3*c*Fres
nelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^
2+1)^(1/2)-4/3*c*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^
(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+16/3*c*x*(-a^2*x^2+1)*(-a^2
*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4751, 4799, 4753, 3393, 3385, 3433, 4809, 4491}

$$-\frac{4\sqrt{2\pi}\,c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}(ax)}\right)}{3a\sqrt{1-a^2x^2}}-\frac{8\sqrt{\pi}\,c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\text{ArcSin}(ax)^{3/2}}+\frac{16cx(1-a^2x^2)\,\sqrt{c-a^2cx^2}}{3\sqrt{\text{ArcSin}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(5/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(3*a*ArcSin[a*x]^(3/2)) + (16*
c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (4*c*Sqrt[2*
Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(3*a*Sqrt
[1 - a^2*x^2]) - (8*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[
a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sin^{-1}(ax)^{5/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} - \frac{\left(8ac\sqrt{c-a^2cx^2}\right)\int \frac{x(1-a^2x^2)}{\sin^{-1}(ax)^{3/2}}\,dx}{3\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\int}{3\sqrt{1-a^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\mathrm{Su}}{3a}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\mathrm{Su}}{}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\mathrm{Sub}}{3a}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\mathrm{Su}}{}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,(c-a^2cx^2)^{3/2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{4c\sqrt{2\pi}\sqrt{c-a^2cx^2}\,C}{3a\sqrt{1}}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.89, size = 251, normalized size = 1.22

$$\frac{c\sqrt{c-a^2cx^2}\left(-14-e^{-4i\mathrm{ArcSin}(ax)}-e^{4i\mathrm{ArcSin}(ax)}+16a^2x^2+8ie^{-4i\mathrm{ArcSin}(ax)}\mathrm{ArcSin}(ax)-8ie^{4i\mathrm{ArcSin}(ax)}\mathrm{ArcSin}(ax)+64ax\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)-16\sqrt{2}\,(-i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},-2i\mathrm{ArcSin}(ax)\right)-16\sqrt{2}\,(i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},2i\mathrm{ArcSin}(ax)\right)-16(-i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},-4i\mathrm{ArcSin}(ax)\right)-16(i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},4i\mathrm{ArcSin}(ax)\right)\right)}{24a\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(5/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(-14 - E^((-4*I)*ArcSin[a*x]) - E^((4*I)*ArcSin[a*x]
) + 16*a^2*x^2 + ((8*I)*ArcSin[a*x])/E^((4*I)*ArcSin[a*x]) - (8*I)*E^((4*I)
*ArcSin[a*x])*ArcSin[a*x] + 64*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] - 16*Sqrt[
2]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcSin[a*x]] - 16*Sqrt[2]*(I*
```

```
ArcSin[a*x])^(3/2)*Gamma[1/2, (2*I)*ArcSin[a*x]] - 16*((-I)*ArcSin[a*x])^(3
/2)*Gamma[1/2, (-4*I)*ArcSin[a*x]] - 16*(I*ArcSin[a*x])^(3/2)*Gamma[1/2, (4
*I)*ArcSin[a*x]]))/(24*a*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{\left(-a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}{\arcsin \left(a x\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(-c\left(a x-1\right)\left(a x+1\right)\right)^{\frac{3}{2}}}{\operatorname{asin}^{\frac{5}{2}}\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(5/2),x)
```

```
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/asin(a*x)**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/arcsin(a*x)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(c-a^2\,c\,x^2\right)^{3/2}}{\mathrm{asin}\left(a\,x\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(5/2),x)
[Out] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(5/2), x)
```

3.478 $\int \frac{\sqrt{c-a^2cx^2}}{\mathbf{ArcSin}(ax)^{5/2}}\,dx$

Optimal. Leaf size=130

$$-\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{3a\text{ArcSin}(ax)^{3/2}}+\frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\text{ArcSin}(ax)}}-\frac{8\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}$$

```
[Out] -8/3*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a
/(-a^2*x^2+1)^(1/2)-2/3*(-a^2*c*x^2+c)^(1/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*
x)^(3/2)+8/3*x*(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2)
```

Rubi [A]
time = 0.05, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4751, 4727, 3385, 3433}

$$-\frac{8\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\text{ArcSin}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}+\frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\text{ArcSin}(ax)}}-\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{3a\text{ArcSin}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(5/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(3*a*ArcSin[a*x]^(3/2)) + (8*x*S
qrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (8*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
```

```
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{c-a^2cx^2}}{\sin^{-1}(ax)^{5/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} - \frac{\left(4a\sqrt{c-a^2cx^2}\right)\int\frac{x}{\sin^{-1}(ax)^{3/2}}\,dx}{3\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(8\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int\frac{\cos(2x)}{\sqrt{x}}\,dx, x\right.}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{\left(16\sqrt{c-a^2cx^2}\right)\mathrm{Subst}\left(\int\cos\left(2x^2\right)\right.}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\,\sqrt{c-a^2cx^2}}{3a\sin^{-1}(ax)^{3/2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\sin^{-1}(ax)}} - \frac{8\sqrt{\pi}\,\sqrt{c-a^2cx^2}\,C\left(\frac{2\sqrt{\sin^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.27, size = 142, normalized size = 1.09

$$\frac{2\sqrt{c-a^2cx^2}\left(-1+a^2x^2+4ax\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)-\sqrt{2}\,(-i\mathrm{ArcSin}(ax))^{3/2}\mathrm{Gamma}\left(\frac{1}{2},-2i\mathrm{ArcSin}(ax)\right)+\frac{\sqrt{2}\,\mathrm{ArcSin}(ax)^2\mathrm{Gamma}\left(\frac{1}{2},2i\mathrm{ArcSin}(ax)\right)}{\sqrt{i\mathrm{ArcSin}(ax)}}\right)}{3a\sqrt{1-a^2x^2}\,\mathrm{ArcSin}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(5/2),x]
```

```
[Out] (2*Sqrt[c - a^2*c*x^2]*(-1 + a^2*x^2 + 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]
- Sqrt[2]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcSin[a*x]] + (Sqrt[2
]*ArcSin[a*x]^2*Gamma[1/2, (2*I)*ArcSin[a*x]])/Sqrt[I*ArcSin[a*x]]))/(3*a*S
qrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))
```

Maple [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-a^{2} c \,x^{2}+c}}{\arcsin \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x)
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{- c \left(a x - 1\right) \left(a x + 1\right)}}{\operatorname{asin}^{\frac{5}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(5/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/asin(a*x)**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-a^2*c*x^2 + c)/arcsin(a*x)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{c-a^2\,c\,x^2}}{\mathrm{asin}\left(a\,x\right)^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(5/2),x)
```

```
[Out] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(5/2), x)
```

3.479 $\int \frac{1}{\sqrt{c-a^2cx^2}\,\textbf{ArcSin}(ax)^{5/2}}\,dx$

Optimal. Leaf size=44

$$-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}}$$

```
[Out] -2/3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2)
```

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {4737}

$$-\frac{2\sqrt{1-a^2x^2}}{3a\text{ArcSin}(ax)^{3/2}\sqrt{c-a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{5/2}}\,dx &= \frac{\sqrt{1-a^2x^2}\int \frac{1}{\sqrt{1-a^2x^2}\,\sin^{-1}(ax)^{5/2}}\,dx}{\sqrt{c-a^2cx^2}}\\ &= -\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\,\sin^{-1}(ax)^{3/2}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 44, normalized size = 1.00

$$-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\,\text{ArcSin}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))
```

Maple [A]
time = 0.11, size = 38, normalized size = 0.86

method	result	size
default	$-\frac{2\sqrt{-a^{2} x^{2}+1}}{3 \arcsin \left(a x\right)^{\frac{3}{2}} a \sqrt{-c \left(a^{2} x^{2}-1\right)}}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3/arcsin(a*x)^(3/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [A]
time = 1.71, size = 48, normalized size = 1.09

$$\frac{2 \sqrt{-a^{2} c x^{2}+c} \sqrt{-a^{2} x^{2}+1}}{3 \left(a^{3} c x^{2}-a c\right) \arcsin \left(a x\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(-a^2*c*x^2 + c)*sqrt(-a^2*x^2 + 1)/((a^3*c*x^2 - a*c)*arcsin(a*x)^
(3/2))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{-c \left(a x-1\right) \left(a x+1\right)} \operatorname{asin}^{\frac{5}{2}} \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(5/2),x)
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(5/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\mathrm{asin}\left(a\,x\right)^{5/2}\,\sqrt{c-a^2\,c\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2)),x)
[Out] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2)), x)
```

3.480 $\int \frac{1}{(c-a^2cx^2)^{3/2}\text{ArcSin}(ax)^{5/2}}\,dx$

Optimal. Leaf size=107

$$-\frac{2\sqrt{1-a^2x^2}}{3a\left(c-a^2cx^2\right)^{3/2}\text{ArcSin}(ax)^{3/2}}+\frac{4a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x}{(1-a^2x^2)^2\text{ArcSin}(ax)^{3/2}},x\right)}{3c\sqrt{c-a^2cx^2}}$$

```
[Out] -2/3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2)+4/3*a*(-a^
2*x^2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^2/arcsin(a*x)^(3/2),x)/c/(-a^2*c
*x^2+c)^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\text{ArcSin}(ax)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)) + (4*a
*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^2*ArcSin[a*x]^(3/2)), x])/(3
*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{5/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{3a\left(c-a^2cx^2\right)^{3/2}\sin^{-1}(ax)^{3/2}}+\frac{\left(4a\sqrt{1-a^2x^2}\right)\int\frac{x}{(1-a^2x^2)^2\sin^{-1}(ax)^{3/2}}}{3c\sqrt{c-a^2cx^2}}$$

Mathematica [A]
time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\text{ArcSin}(ax)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)), x]
```

Maple [A]
time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arcsin \left(a x\right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3005 deep
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(5/2)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{asin}\left(a\,x\right)^{5/2}\,{\left(c-a^2\,c\,x^2\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2)),x)
[Out] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2)), x)
```

3.481 $\int \frac{1}{(c-a^2cx^2)^{5/2}\textbf{ArcSin}(ax)^{5/2}}\,dx$

Optimal. Leaf size=107

$$-\frac{2\sqrt{1-a^2x^2}}{3a\left(c-a^2cx^2\right)^{5/2}\text{ArcSin}(ax)^{3/2}}+\frac{8a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x}{(1-a^2x^2)^3\text{ArcSin}(ax)^{3/2}},x\right)}{3c^2\sqrt{c-a^2cx^2}}$$

```
[Out] -2/3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2)+8/3*a*(-a^
2*x^2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^3/arcsin(a*x)^(3/2),x)/c^2/(-a^2
*c*x^2+c)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\text{ArcSin}(ax)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)) + (8*a
*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^3*ArcSin[a*x]^(3/2)), x])/(3
*c^2*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^{5/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{3a\left(c-a^2cx^2\right)^{5/2}\sin^{-1}(ax)^{3/2}}+\frac{\left(8a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^3\sin^{-1}(ax)^{3/}}$$

$$3c^2\sqrt{c-a^2cx^2}$$

Mathematica [A]
time = 1.30, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\text{ArcSin}(ax)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)), x]
```

Maple [A]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(-a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arcsin \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6190 deep
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^(5/2)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{asin}\left(a\,x\right)^{5/2}\,{\left(c-a^2\,c\,x^2\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(5/2)), x)
```

3.482 $\int x^2 \sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=259

$$\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}}+\frac{i2^{-2(3+n)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Ga}}{c^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/8*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c^3/(1+n)/(-c^2*x^2+1)^(
1/2)+I*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+
d)^(1/2)/(2^(6+2*n))/c^3/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^
2+1)^(1/2)-I*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,4*I*(a+b*arcsin(c*x
))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(6+2*n))/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^
2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.24, antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$, Rules used = {4809, 4491, 3388, 2212}

$$\frac{i2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}-\frac{i2^{-2(n+3)}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{n+1}}{8bc^3(n+1)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c^3*(1 + n)*Sqrt[1 -
 c^2*x^2]) + (I*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4
*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^
2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*E^(((4*I)*a)/b)*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(
2^(2*(3 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int x^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx &= \frac{\sqrt{d-c^2dx^2}\int x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int (a+bx)^n\cos^2(x)\sin^2(x)\,dx,x,\sin^{-1}(cx)\right)}{c^3\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int \left(\frac{1}{8}(a+bx)^n-\frac{1}{8}(a+bx)^n\cos(4x)\right)\,dx,x,\text{si}\right.}{c^3\sqrt{1-c^2x^2}}\\
&= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int (a+bx\right.}{8c^3\sqrt{1-}}\\
&= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int e^{-4ix}(a\right.}{16c^3\sqrt{1-}}\\
&= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}}+\frac{i4^{-3-n}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}\,(a+}{}
\end{aligned}$$

Mathematica [A]
time = 0.58, size = 189, normalized size = 0.73

$$\frac{d\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{8(a+b\text{ArcSin}(cx))}{b+bn}+i4^{-n}e^{-\frac{4ia}{b}}\left(\frac{(a+b\text{ArcSin}(cx))^2}{b^2}\right)^{-n}\left(\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,-\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)-e^{\frac{8ia}{b}}\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)}{64c^3\sqrt{d\,(1-c^2x^2)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((8*(a + b*ArcSin[c*x]))/(b + b*
n) + (I*(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c
```

```
*x]))/b] - E^(((8*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((
4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I)*a)/b)*((a + b*ArcSin[c*x])^2/
b^2)^n)))/(64*c^3*Sqrt[d*(1 - c^2*x^2)])
```

Maple [F]
time = 0.47, size = 0, normalized size = 0.00

$$\int x^{2} \sqrt{-c^{2} d \,x^{2}+d}\, \left(a +b \arcsin \left(c x \right)\right)^{n} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2} \sqrt{- d \left(c x - 1\right) \left(c x + 1\right)} \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2 (a + b \operatorname{asin}(c x))^n \sqrt{d - c^2 d x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2), x)
```

3.483 $\int x\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=391

$$-\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{e^{\frac{ia}{b}}\sqrt{d-c}}{}$$

```
[Out] -1/8*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(
1/2)/c^2/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/8*exp
(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)
^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/8*3^(-1-n)*(a+b
*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^
2/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/8*3^(-1-n)
*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.26, antiderivative size = 391, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4809, 4491, 3389, 2212}

$$-\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{3^{-n-1}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{e^{\frac{ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{3^{-n-1}e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/8*(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*A
rcSin[c*x]))/b])/(c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*
x]))/b)^n) - (E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
 + n, (I*(a + b*ArcSin[c*x]))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSi
n[c*x]))/b)^n) - (3^(-1 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*c^2*E^(((3*I)*a)/b)*Sqrt[1 - c
^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(-1 - n)*E^(((3*I)*a)/b)*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*
x]))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int x\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx=\frac{\sqrt{d-c^2dx^2}\int x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$
$$=\frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int(a+bx)^n\cos^2(x)\sin(x)\,dx,x,\sin^{-1}(cx)\right)}{c^2\sqrt{1-c^2x^2}}$$
$$=\frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int\left(\frac{1}{4}(a+bx)^n\sin(x)+\frac{1}{4}(a+bx)^n\sin(3x)\right)\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\,\mathrm{Subst}\left(\int(a+bx)^n\sin(x)\,dx,x,\sin^{-1}(cx)\right)}{4c^2\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2}$$
$$=\frac{\left(i\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int e^{-ix}(a+bx)^n\,dx,x,\sin^{-1}(cx)\right)}{8c^2\sqrt{1-c^2x^2}}-\frac{\left(i\sqrt{d}\right.}{}$$
$$=-\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i\left(a+b\sin^{-1}(cx)\right)}{b}\right)^{-n}\Gamma\left(1+n\right.}{8c^2\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.58, size = 272, normalized size = 0.70

$$\frac{de^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))^n\left(3e^{\frac{2ia}{b}}\left(-\left(-\frac{i(a+b\mathrm{ArcSin}(cx))}{b}\right)^{-n}\mathrm{Gamma}\left(1+n,-\frac{i(a+b\mathrm{ArcSin}(cx))}{b}\right)-e^{\frac{2ia}{b}}\left(\frac{i(a+b\mathrm{ArcSin}(cx))}{b}\right)^{-n}\mathrm{Gamma}\left(1+n,\frac{i(a+b\mathrm{ArcSin}(cx))}{b}\right)\right)-3^{-n}\left(\frac{(a+b\mathrm{ArcSin}(cx))^2}{b^2}\right)^{-n}\left(\left(\frac{i(a+b\mathrm{ArcSin}(cx))}{b}\right)^n\mathrm{Gamma}\left(1+n,-\frac{3i(a+b\mathrm{ArcSin}(cx))}{b}\right)+e^{\frac{6ia}{b}}\left(-\frac{i(a+b\mathrm{ArcSin}(cx))}{b}\right)^n\mathrm{Gamma}\left(1+n,\frac{3i(a+b\mathrm{ArcSin}(cx))}{b}\right)\right)\right)}{24c^2\sqrt{d\left(1-c^2x^2\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(3*E^(((2*I)*a)/b)*(-(Gamma[1 +
n, ((-I)*(a + b*ArcSin[c*x]))/b]/(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (E^(((
2*I)*a)/b)*Gamma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/((I*(a + b*ArcSin[c*x])
)/b)^n) - (((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin
[c*x]))/b] + E^(((6*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
((3*I)*(a + b*ArcSin[c*x]))/b])/(3^n*((a + b*ArcSin[c*x])^2/b^2)^n)))/(24*c
^2*E^(((3*I)*a)/b)*Sqrt[d*(1 - c^2*x^2)])
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int x\sqrt{-c^2 d\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Integral(x*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^n\,\sqrt{d-c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2), x)
```

3.484 $\int \sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=259

$$\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-3-n}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gam}}{c\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c/(1+n)/(-c^2*x^2+1)^(1/
2)-I*2^(-3-n)*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x))/b)*(-c^2
*d*x^2+d)^(1/2)/c/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1
/2)+I*2^(-3-n)*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*I*(a+b*arcsin(c
*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/
2)
```

Rubi [A]
time = 0.17, antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {4753, 3393, 3388, 2212}

$$-\frac{i2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}+\frac{i2^{-n-3}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{n+1}}{2bc(n+1)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(2*b*c*(1 + n)*Sqrt[1 - c
^2*x^2]) - (I*2^(-3 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
+ n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2*x^2]*
(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*E^(((2*I)*a)/b)*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b
])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}\int \sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx &= \frac{\sqrt{d-c^2dx^2}\int\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}\\ &= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int(a+bx)^n\cos^2(x)\,dx,x,\sin^{-1}(cx)\right)}{c\sqrt{1-c^2x^2}}\\ &= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int\left(\frac{1}{2}(a+bx)^n+\frac{1}{2}(a+bx)^n\cos(2x)\right)\,dx,x,\sin^{-}\right.}{c\sqrt{1-c^2x^2}}\\ &= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int(a+bx)^n\right.}{2c\sqrt{1-c^2}}\\ &= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}}+\frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int e^{-2ix}(a+\right.}{4c\sqrt{1-c^2x}}\\ &= \frac{\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-3-n}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b}{}\end{aligned}$$

Mathematica [A]
time = 0.52, size = 182, normalized size = 0.70

$$\frac{d\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{4a+4b\text{ArcSin}(cx)}{b+bn}-i2^{-n}e^{-\frac{2ia}{b}}\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)+i2^{-n}e^{\frac{2ia}{b}}\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)\right)}{8c\sqrt{d\,(1-c^2x^2)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((4*a + 4*b*ArcSin[c*x])/(b + b*
n) - (I*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*E^(((2*I)*a)/b)*
(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*E^(((2*I)*a)/b)*Gamma[1 + n, ((2*I)*
```

(a + b*ArcSin[c*x]))/b])/(2^n*((I*(a + b*ArcSin[c*x]))/b)^n)))/(8*c*Sqrt[d*
(1 - c^2*x^2)])

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \sqrt{-c^2 d\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{asin}(c\,x))^n\,\sqrt{d - c^2\,d\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2), x)
```

3.485 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^n}{x}\,dx$

Optimal. Leaf size=219

$$\frac{de^{-\frac{ia}{b}}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}}+\frac{de^{\frac{ia}{b}}\sqrt{1-c}}{}$$

```
[Out] 1/2*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1
/2)/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/2*d*exp(
I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1
/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+d*Unintegrable((a+b*ar
csin(c*x))^n/x/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [A]
time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin
[c*x]))/b])/(2*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/
b)^n) + (d*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n,
 (I*(a + b*ArcSin[c*x]))/b])/(2*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x])
)/b)^n) + d*Defer[Int][(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^n}{x}\,dx=\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^n}{x}\,dx$$

Mathematica [A]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x,x]
[Out] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [A]
time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^{2} d\,x^{2}+d}\,\left(a+b\arcsin\left(c x\right)\right)^{n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x)
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-d\left(c x-1\right)\left(c x+1\right)}\,\left(a+b\operatorname{asin}\left(c x\right)\right)^{n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n/x,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n/x, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,\sqrt{d-c^2\,d\,x^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x, x)
```

3.486 $\int \frac{\sqrt{d-c^2dx^2}\,(a+b\mathbf{ArcSin}(cx))^n}{x^2}\,dx$

Optimal. Leaf size=88

$$-\frac{cd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{b(1+n)\sqrt{d-c^2dx^2}}+d\text{Int}\left(\frac{(a+b\text{ArcSin}(cx))^n}{x^2\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] -c*d*(a+b*arcsin(c*x))^(1+n)*(-c^2*x^2+1)^(1/2)/b/(1+n)/(-c^2*d*x^2+d)^(1/2
)+d*Unintegrable((a+b*arcsin(c*x))^n/x^2/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [A]
time = 0.25, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] -((c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(b*(1 + n)*Sqrt[d - c
^2*d*x^2])) + d*Defer[Int][(a + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]),
 x]
```

Rubi steps

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^n}{x^2}\,dx=\int \frac{\sqrt{d-c^2dx^2}\,(a+b\sin^{-1}(cx))^n}{x^2}\,dx$$

Mathematica [A]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [A]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-c^{2} d \,x^{2}+d}\, \left(a +b \arcsin \left(c x \right)\right)^{n}}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x)
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{- d \left(c x - 1\right) \left(c x + 1\right)} \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{n}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n/x**2,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n/x**2, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,\sqrt{d-c^2\,d\,x^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x^2, x)
```

3.487 $\int x^2(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=684

$$\frac{d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-7-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Ga}}{c^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/16*d*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c^3/(1+n)/(-c^2*x^2+1
)^(1/2)-I*2^(-7-n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x))/b
)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*
x^2+1)^(1/2)+I*2^(-7-n)*d*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*I*(a
+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c
^2*x^2+1)^(1/2)+I*2^(-7-2*n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcs
in(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)
^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-2*n)*d*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMM
A(1+n,4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x
))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^(-7-n)*3^(-1-n)*d*(a+b*arcsin(c*x))^n*GAMMA
(1+n,-6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(6*I*a/b)/((-I*(
a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-n)*3^(-1-n)*d*exp(6*I*a/b
)*(a+b*arcsin(c*x))^n*GAMMA(1+n,6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/
2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.45, antiderivative size = 684, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$, Rules used = {4809, 4491, 3388, 2212}

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c^3*(1 + n)*Sqrt[
1 - c^2*x^2]) - (I*2^(-7 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sqrt[1 -
c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d*E^(((2*I)*a)/b
)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcS
in[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^
(-7 - 2*n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)
*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a
+ b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - 2*n)*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(c^
3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 -
n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-6*I)*(a + b*
```

```
ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcS
in[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d*E^(((6*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(c
^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int x^2 \left(d-c^2dx^2\right)^{3/2} \left(a+b\sin^{-1}(cx)\right)^n \, dx = \frac{\left(d\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n \, dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^4(x)\sin^2(x)\,dx, x, \sin^{-1}(c\right.}{c^3\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{16}(a+bx)^n+\frac{1}{32}(a+bx)^n\cos(2x)-\right.\right.}{c^3\sqrt{1-}}$$

$$= \frac{d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}} + \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\right.}{32c^3}$$

$$= \frac{d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}} + \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\right.}{64c^3}$$

$$= \frac{d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{i2^{-7-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(}{}$$

Mathematica [A]
time = 1.98, size = 436, normalized size = 0.64

$$\frac{d^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{24(a+b\text{ArcSin}(cx))}{b+bn}+3i2^{-n}e^{-\frac{2ia}{b}}\left(\frac{(a+b\text{ArcSin}(cx))^2}{b^2}\right)^{-n}\left(-\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,-\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{4ia}{b}}\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)\right)+3i4^{-n}e^{-\frac{4ia}{b}}\left(\frac{(a+b\text{ArcSin}(cx))^2}{b^2}\right)^{-n}\left(\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,-\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)-e^{\frac{8ia}{b}}\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)\right)+i6^{-n}e^{-\frac{6ia}{b}}\left(\frac{(a+b\text{ArcSin}(cx))^2}{b^2}\right)^{-n}\left(\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,-\frac{6i(a+b\text{ArcSin}(cx))}{b}\right)-e^{\frac{12ia}{b}}\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,\frac{6i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)}{384c^3\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((24*(a + b*ArcSin[c*x]))/(b +
 b*n) + ((3*I)*(-(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-2*I)*(a + b
*ArcSin[c*x]))/b]) + E^(((4*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma
[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b]))/(2^n*E^(((2*I)*a)/b)*((a + b*ArcSi
n[c*x])^2/b^2)^n) + ((3*I)*(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4
*I)*(a + b*ArcSin[c*x]))/b] - E^(((8*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b
)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I)*a)/b)*((a
+ b*ArcSin[c*x])^2/b^2)^n) + (I*(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
 ((-6*I)*(a + b*ArcSin[c*x]))/b] - E^(((12*I)*a)/b)*(((-I)*(a + b*ArcSin[c*
x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b]))/(6^n*E^(((6*I)*a)/b
)*((a + b*ArcSin[c*x])^2/b^2)^n)))/(384*c^3*Sqrt[d - c^2*d*x^2])
```

Maple [F]
time = 0.44, size = 0, normalized size = 0.00

$$\int x^2\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral(-(c^2*d*x^4 - d*x^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x
)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3004 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^n\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2), x)
```

3.488 $\int x(d-c^2dx^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=595

$$-\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}}-\frac{de^{\frac{ia}{b}}\sqrt{d}}{}$$

```
[Out] -1/16*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d
)^(1/2)/c^2/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/16
*d*exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*d*
x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/32*d*(a+b
*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(3
^n)/c^2/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/32*d
*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/(3^n)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/3
2*5^(-1-n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-5*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c^2/exp(5*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(
1/2)-1/32*5^(-1-n)*d*exp(5*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,5*I*(a+b*ar
csin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^
2+1)^(1/2)
```

Rubi [A]
time = 0.34, antiderivative size = 595, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4809, 4491, 3389, 2212}

$$-\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}}-\frac{d3^{-n}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}-\frac{d5^{-n-1}e^{-\frac{5ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{5i(a+b\text{ArcSin}(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}-\frac{de^{\frac{ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}}-\frac{d3^{-n}e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}-\frac{d5^{-n-1}e^{\frac{5ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{5i(a+b\text{ArcSin}(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/16*(d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a +
b*ArcSin[c*x]))/b])/(c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin
[c*x]))/b)^n) - (d*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(16*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b
*ArcSin[c*x]))/b)^n) - (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(32*3^n*c^2*E^(((3*I)*a)/b)*Sqrt[1 -
 c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d*E^(((3*I)*a)/b)*Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b]
)/(32*3^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (5^(-1 - n
)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-5*I)*(a + b*A
rcSin[c*x]))/b])/(32*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Ar
cSin[c*x]))/b)^n) - (5^(-1 - n)*d*E^(((5*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/(32*c^2*Sqrt[
1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx=\frac{\left(d\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^4(x)\sin(x)\,dx,x,\sin^{-1}(c\right.}{c^2\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{8}(a+bx)^n\sin(x)+\frac{3}{16}(a+bx)^n\sin(\right.\right.}{c^2\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\sin(5x)\,dx,x,\sin^{-1}(cx)\right)}{16c^2\sqrt{1-c^2x^2}}+$$

$$=\frac{\left(id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-5ix}(a+bx)^n\,dx,x,\sin^{-1}(cx)\right)}{32c^2\sqrt{1-c^2x^2}}-$$

$$=-\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i(a+b\sin^{-1}(cx))}{b}\right)^{-n}\Gamma\left(1\right.}{16c^2\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 1.39, size = 464, normalized size = 0.78

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/32*(15^(-1 - n)*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(2*15^(1 + n
)*E^(((4*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*((a + b*ArcSin[c*x])^2/b^2)
^(2*n)*Gamma[1 + n, ((-I)*(a + b*ArcSin[c*x]))/b] + (((-I)*(a + b*ArcSin[c*
x]))/b)^n*(2*15^(1 + n)*E^(((6*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*G
amma[1 + n, (I*(a + b*ArcSin[c*x]))/b] + 3*(5^(1 + n)*E^(((2*I)*a)/b)*((I*(
a + b*ArcSin[c*x]))/b)^(2*n)*((a + b*ArcSin[c*x])^2/b^2)^n*Gamma[1 + n, ((-
3*I)*(a + b*ArcSin[c*x]))/b] + 5^(1 + n)*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x
])^2/b^2)^(2*n)*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b] + 3^n*((((-I)*(
a + b*ArcSin[c*x]))/b)^n*((I*(a + b*ArcSin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-
5*I)*(a + b*ArcSin[c*x]))/b] + E^(((10*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)
^(2*n)*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])))))/(c^2*E^(((5*I)*a)/b
)*Sqrt[d - c^2*d*x^2]*((a + b*ArcSin[c*x])^2/b^2)^(3*n))
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int x\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*d*x^3 - d*x)*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2), x)
```

3.489 $\int \left(d-c^2dx^2\right)^{3/2} (a+b\text{ArcSin}(cx))^n \, dx$

Optimal. Leaf size=466

$$\frac{3d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-3-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{G}}{c\sqrt{1-c^2x^2}}$$

```
[Out] 3/8*d*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c/(1+n)/(-c^2*x^2+1)^(
1/2)-I*2^(-3-n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x))/b)*(
-c^2*d*x^2+d)^(1/2)/c/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1
)^(1/2)+I*2^(-3-n)*d*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*I*(a+b*ar
csin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+
1)^(1/2)-I*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/(2^(6+2*n))/c/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^
2*x^2+1)^(1/2)+I*d*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,4*I*(a+b*arcs
in(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(6+2*n))/c/((I*(a+b*arcsin(c*x))/b)^n)/
(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.25, antiderivative size = 466, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {4753, 3393, 3388, 2212}

$$-\frac{id2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}-\frac{id2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,-\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}+\frac{id2^{-n-3}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}+\frac{id2^{-2(n+3)}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(n+1,\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}+\frac{3d\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{n+1}}{8bc(n+1)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c*(1 + n)*Sqrt[1
 - c^2*x^2]) - (I*2^(-3 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*d*E^(((2*I)*a)/b)*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[
c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I*d*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x
]))/b])/(2^(2*(3 + n))*c*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Ar
cSin[c*x]))/b)^n) + (I*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c*Sqrt[
1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
```

```
((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx=\frac{\left(d\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int (a+bx)^n\cos^4(x)\,dx,x,\sin^{-1}(cx)\right)}{c\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \left(\frac{3}{8}(a+bx)^n+\frac{1}{2}(a+bx)^n\cos(2x)+\frac{1}{8}(\right.\right.}{c\sqrt{1-c^2x^2}}$$

$$=\frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int (\right.}{8c}$$

$$=\frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\right.}{16c}$$

$$=\frac{3d\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-3-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(}{}$$

Mathematica [A]
time = 1.06, size = 326, normalized size = 0.70

$$\frac{d^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{8(a+b\text{ArcSin}(cx))}{b+bn}+8\left(\frac{4a+4b\text{ArcSin}(cx)}{b+bn}-i2^{-n}e^{-\frac{2ia}{b}}\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)+i2^{-n}e^{\frac{2ia}{b}}\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,\frac{2i(a+b\text{ArcSin}(cx))}{b}\right)\right)+i4^{-n}e^{-\frac{4ia}{b}}\left(\frac{(a+b\text{ArcSin}(cx))^2}{b^2}\right)^{-n}\left(-\left(\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,-\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{8ia}{b}}\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^n\text{Gamma}\left(1+n,\frac{4i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)}{64c\sqrt{d-c^2dx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((-8*(a + b*ArcSin[c*x]))/(b +
 b*n) + 8*((4*a + 4*b*ArcSin[c*x])/(b + b*n) - (I*Gamma[1 + n, ((-2*I)*(a +
 b*ArcSin[c*x]))/b])/(2^n*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n)
 + (I*E^(((2*I)*a)/b)*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*((I
*(a + b*ArcSin[c*x]))/b)^n)) + (I*(-(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1
+ n, ((-4*I)*(a + b*ArcSin[c*x]))/b]) + E^(((8*I)*a)/b)*(((-I)*(a + b*ArcSi
n[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I)*
a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n)))/(64*c*Sqrt[d - c^2*d*x^2])
```

Maple [F]
time = 0.10, size = 0, normalized size = 0.00

$$\int \left(-c^2 d\,x^2+d\right)^{\frac{3}{2}} \left(a+b\arcsin\left(cx\right)\right)^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
[Out] Timed out
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2),x)
[Out] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2), x)
```

3.490 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^n}{x}\,dx$

Optimal. Leaf size=427

$$\frac{5d^2e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}+\frac{5d^2e^{\frac{ia}{b}}\sqrt{1}}{}$$

```
[Out] 5/8*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^
(1/2)/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+5/8*d^2*
exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1
)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/8*3^(-1-n)*d^2*(
a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/e
xp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/8*3^(-1-n)*
d^2*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(-c
^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+d^2*Uninte
grable((a+b*arcsin(c*x))^n/x/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [A]

time = 0.70, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\text{ArcSin}(cx))^n}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] (5*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*Ar
cSin[c*x]))/b])/(8*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x
]))/b)^n) + (5*d^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(8*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcS
in[c*x]))/b)^n) + (3^(-1 - n)*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*E^(((3*I)*a)/b)*Sqrt[d - c^
2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (3^(-1 - n)*d^2*E^(((3*I)*a)/b
)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin
[c*x]))/b])/(8*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^2*Def
er[Int][(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))^n}{x}\,dx = \int \frac{(d-c^2dx^2)^{3/2}\,(a+b\sin^{-1}(cx))^n}{x}\,dx$$

Mathematica [A]
time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\text{ArcSin}(cx))^n}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x,x]
[Out] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [A]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{(-c^2d\,x^2+d)^{\frac{3}{2}}(a+b\arcsin(cx))^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x)
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\text{asin}(cx))^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n/x,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**n/x, x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^n\,{\left(d-c^2\,d\,x^2\right)}^{3/2}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x, x)
```

3.491 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\textbf{ArcSin}(cx))^n}{x^2}\,dx$

Optimal. Leaf size=298

$$-\frac{3cd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{2b(1+n)\sqrt{d-c^2dx^2}}+\frac{i2^{-3-n}cd^2e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$

```
[Out] -3/2*c*d^2*(a+b*arcsin(c*x))^(1+n)*(-c^2*x^2+1)^(1/2)/b/(1+n)/(-c^2*d*x^2+d
)^(1/2)+I*2^(-3-n)*c*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x
))/b)*(-c^2*x^2+1)^(1/2)/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*
x^2+d)^(1/2)-I*2^(-3-n)*c*d^2*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*
I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2
*d*x^2+d)^(1/2)+d^2*Unintegrable((a+b*arcsin(c*x))^n/x^2/(-c^2*d*x^2+d)^(1/
2),x)
```

Rubi [A]
time = 0.53, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] (-3*c*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(2*b*(1 + n)*Sqrt[
d - c^2*d*x^2]) + (I*2^(-3 - n)*c*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(E^(((2*I)*a)/b)*Sqrt[d -
c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-3 - n)*c*d^2*E^(((2*I
)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*
ArcSin[c*x]))/b])/(Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^2
*Defer[Int][(a + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx=\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^n}{x^2}\,dx$$

Mathematica [A]
time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [A]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}} \left(a +b \arcsin \left(c x \right)\right)^{n}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

```
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
```

```
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n/x**2,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,{\left(d-c^2\,d\,x^2\right)}^{3/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x^2, x)
```

3.492 $\int x^2(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=906

$$\frac{5d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}}{c^3\sqrt{1-c^2x^2}}$$

```
[Out] 5/128*d^2*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c^3/(1+n)/(-c^2*x^
2+1)^(1/2)-I*2^(-7-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*
x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(
-c^2*x^2+1)^(1/2)+I*2^(-7-n)*d^2*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n
,2*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)
^n)/(-c^2*x^2+1)^(1/2)+I*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin
(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(8+2*n))/c^3/exp(4*I*a/b)/((-I*(a+b*arcsi
n(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*d^2*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAM
MA(1+n,4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(8+2*n))/c^3/((I*(a
+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^(-7-n)*3^(-1-n)*d^2*(a+b*arcsi
n(c*x))^n*GAMMA(1+n,-6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(
6*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-n)*3^(-1-n
)*d^2*exp(6*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,6*I*(a+b*arcsin(c*x))/b)*(
-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^
(-11-3*n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-8*I*(a+b*arcsin(c*x))/b)*(-c^2
*d*x^2+d)^(1/2)/c^3/exp(8*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^
(1/2)-I*2^(-11-3*n)*d^2*exp(8*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,8*I*(a+b
*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2
*x^2+1)^(1/2)
```

Rubi [A]
time = 0.56, antiderivative size = 906, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$, Rules used = {4809, 4491, 3388, 2212}

Antiderivative was successfully verified.

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(128*b*c^3*(1 + n)*
Sqrt[1 - c^2*x^2]) - (I*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d^2*E^(((
2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a
 + b*ArcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n
) + (I*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(
```

```
a + b*ArcSin[c*x]))/b])/(2^(2*(4 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*d^2*E^(((4*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2
^(2*(4 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-
7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n
, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(
((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I)*a
)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*A
rcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I
*2^(-11 - 3*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(-8*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((8*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-
I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-11 - 3*n)*d^2*E^(((8*I)*a)/b)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((8*I)*(a + b*ArcSin[c*x])
)/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int x^2\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int x^2(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^6(x)\sin^2(x)\,dx,x,\sin^{-1}(\right.}{c^3\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{5}{128}(a+bx)^n+\frac{1}{32}(a+bx)^n\cos(2x)\right.\right.}{}$$

$$=\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}}{12}$$

$$=\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}}{256}$$

$$=\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}}-\frac{i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx}}{}$$

Mathematica [A]
time = 2.66, size = 989, normalized size = 1.09

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (2^(-11 - 3*n)*3^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(5*2^
(4 + 3*n)*3^(1 + n)*a*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n + 5*2^(
4 + 3*n)*3^(1 + n)*b*E^(((8*I)*a)/b)*ArcSin[c*x]*((a + b*ArcSin[c*x])^2/b^2
)^n - I*3^(1 + n)*4^(2 + n)*b*E^(((6*I)*a)/b)*(1 + n)*((I*(a + b*ArcSin[c*x
]))/b)^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 + n)*4^(2 +
n)*b*E^(((10*I)*a)/b)*(1 + n)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
 ((2*I)*(a + b*ArcSin[c*x]))/b] + I*2^(3 + n)*3^(1 + n)*b*E^(((4*I)*a)/b)*(
(I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b] +
 I*2^(3 + n)*3^(1 + n)*b*E^(((4*I)*a)/b)*n*((I*(a + b*ArcSin[c*x]))/b)^n*Ga
mma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b] - I*2^(3 + n)*3^(1 + n)*b*E^(((1
2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcS
in[c*x]))/b] - I*2^(3 + n)*3^(1 + n)*b*E^(((12*I)*a)/b)*n*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b] + I*4^(2 + n)*b
*E^(((2*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-6*I)*(a + b*
ArcSin[c*x]))/b] + I*4^(2 + n)*b*E^(((2*I)*a)/b)*n*((I*(a + b*ArcSin[c*x]))
```

```
/b)^n*Gamma[1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b] - I*4^(2 + n)*b*E^(((14*
I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin
[c*x]))/b] - I*4^(2 + n)*b*E^(((14*I)*a)/b)*n*(((-I)*(a + b*ArcSin[c*x]))/b
)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 + n)*b*((I*(a + b*
ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-8*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 +
n)*b*n*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-8*I)*(a + b*ArcSin[c*x
]))/b] - I*3^(1 + n)*b*E^(((16*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Ga
mma[1 + n, ((8*I)*(a + b*ArcSin[c*x]))/b] - I*3^(1 + n)*b*E^(((16*I)*a)/b)*
n*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((8*I)*(a + b*ArcSin[c*x]))
/b]))/(b*c^3*E^(((8*I)*a)/b)*(1 + n)*Sqrt[d - c^2*d*x^2]*((a + b*ArcSin[c*x
])^2/b^2)^n)
```

Maple [F]
time = 0.42, size = 0, normalized size = 0.00

$$\int x^{2} \left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral((c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2)*sqrt(-c^2*d*x^2 + d)*(b*ar
csin(c*x) + a)^n, x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,(a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2), x)
```

3.493 $\int x(d-c^2dx^2)^{5/2}(a+b\text{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=815

$$-\frac{5d^2e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}-\frac{5d^2e^{\cdots}}{}$$

```
[Out] -5/128*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^
2+d)^(1/2)/c^2/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-5
/128*d^2*exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-
c^2*d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/128
*3^(1-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c^2/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(
1/2)-1/128*3^(1-n)*d^2*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*
arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*
x^2+1)^(1/2)-1/128*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-5*I*(a+b*arcsin(c*x))
/b)*(-c^2*d*x^2+d)^(1/2)/(5^n)/c^2/exp(5*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n
)/(-c^2*x^2+1)^(1/2)-1/128*d^2*exp(5*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,5
*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(5^n)/c^2/((I*(a+b*arcsin(c*x)
)/b)^n)/(-c^2*x^2+1)^(1/2)-1/128*7^(-1-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n
,-7*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/exp(7*I*a/b)/((-I*(a+b*
arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/128*7^(-1-n)*d^2*exp(7*I*a/b)*(a+b*
arcsin(c*x))^n*GAMMA(1+n,7*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/
((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.43, antiderivative size = 815, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {4809, 4491, 3389, 2212}

Antiderivative was successfully verified.

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (-5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b
*ArcSin[c*x]))/b])/(128*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n) - (5*d^2*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^n*Gamma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((
I*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*E^(((3*
I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d
^2*E^(((3*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin
```

```
[c*x]))/b)^n) - (d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n,
 ((-5*I)*(a + b*ArcSin[c*x]))/b])/(128*5^n*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d^2*E^(((5*I)*a)/b)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/
(128*5^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (7^(-1 - n)
*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-7*I)*(a + b*
ArcSin[c*x]))/b])/(128*c^2*E^(((7*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*
ArcSin[c*x]))/b)^n) - (7^(-1 - n)*d^2*E^(((7*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^n*Gamma[1 + n, ((7*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*
Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int x\left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^6(x)\sin(x)\,dx,x,\sin^{-1}(\right.}{c^2\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{5}{64}(a+bx)^n\sin(x)+\frac{9}{64}(a+bx)^n\sin\right.\right.}{c^2\sqrt{}}$$

$$= \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\sin(7x)\,dx,x,\sin^{-1}(cx)\right)}{64c^2\sqrt{1-c^2x^2}}+$$

$$= \frac{\left(id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-7ix}(a+bx)^n\,dx,x,\sin^{-1}(cx)\right)}{128c^2\sqrt{1-c^2x^2}}-$$

$$= -\frac{5d^2e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^n\left(-\frac{i(a+b\sin^{-1}(cx))}{b}\right)^{-n}\Gamma(}{128c^2\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 2.60, size = 603, normalized size = 0.74

Antiderivative was successfully verified.

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/128*(21^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(105^(1 + n
)*E^(((6*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*((a + b*ArcSin[c*x])^2/b^2)
^(2*n)*Gamma[1 + n, ((-I)*(a + b*ArcSin[c*x]))/b] + (((-I)*(a + b*ArcSin[c*
x]))/b)^n*(105^(1 + n)*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Ga
mma[1 + n, (I*(a + b*ArcSin[c*x]))/b] + 9*5^n*7^(1 + n)*E^(((4*I)*a)/b)*((I
*(a + b*ArcSin[c*x]))/b)^(2*n)*((a + b*ArcSin[c*x])^2/b^2)^n*Gamma[1 + n, (
(-3*I)*(a + b*ArcSin[c*x]))/b] + 9*5^n*7^(1 + n)*E^(((10*I)*a)/b)*((a + b*A
rcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b] + 3^(1
 + n)*(7^(1 + n)*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*((I*(a +
b*ArcSin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-5*I)*(a + b*ArcSin[c*x]))/b] + 7^(
1 + n)*E^(((12*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((5*
I)*(a + b*ArcSin[c*x]))/b] + 5^n*((((-I)*(a + b*ArcSin[c*x]))/b)^n*((I*(a +
 b*ArcSin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-7*I)*(a + b*ArcSin[c*x]))/b] + E^
(((14*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((7*I)*(a + b
*ArcSin[c*x]))/b])))))/(5^n*c^2*E^(((7*I)*a)/b)*Sqrt[d - c^2*d*x^2]*((a + b
*ArcSin[c*x])^2/b^2)^(3*n))
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int x\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral((c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x)*sqrt(-c^2*d*x^2 + d)*(b*arcs
in(c*x) + a)^n, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2), x)
```

3.494 $\int \left(d-c^2dx^2\right)^{5/2}(a+b\textbf{ArcSin}(cx))^n\,dx$

Optimal. Leaf size=698

$$\frac{5d^2\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}}-\frac{15i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

```
[Out] 5/16*d^2*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c/(1+n)/(-c^2*x^2+1
)^(1/2)-15*I*2^(-7-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*
x))/b)*(-c^2*d*x^2+d)^(1/2)/c/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c
^2*x^2+1)^(1/2)+15*I*2^(-7-n)*d^2*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+
n,2*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^
n)/(-c^2*x^2+1)^(1/2)-3*I*2^(-7-2*n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I
*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/exp(4*I*a/b)/((-I*(a+b*arcsin(
c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+3*I*2^(-7-2*n)*d^2*exp(4*I*a/b)*(a+b*arcsin(
c*x))^n*GAMMA(1+n,4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*
arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-n)*3^(-1-n)*d^2*(a+b*arcsin(c
*x))^n*GAMMA(1+n,-6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/exp(6*I*a
/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^(-7-n)*3^(-1-n)*d^2
*exp(6*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,6*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.35, antiderivative size = 698, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}=0.154$, Rules used = {4753, 3393, 3388, 2212}

[illegible]

Antiderivative was successfully verified.

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c*(1 + n)*Sqr
t[1 - c^2*x^2]) - ((15*I)*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((15*I)*2^(-7 - n)*d^2*
E^(((2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*
I)*(a + b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b
)^n) - ((3*I)*2^(-7 - 2*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((4*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((3*I)*2^(-7 - 2*n)*d^2*E^(((4*I)
*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b
*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I
*2^(-7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[
```

```
1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I
)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a +
b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\int \left(d-c^2dx^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)^n\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^n\cos^6(x)\,dx,x,\sin^{-1}(cx)\right)}{c\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{5}{16}(a+bx)^n+\frac{15}{32}(a+bx)^n\cos(2x)+\frac{3}{1}\right.\right.}{c\sqrt{1-c^2}}$$

$$=\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\right.}{32c}$$

$$=\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}}+\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\right.}{64c\sqrt{}}$$

$$=\frac{5d^2\sqrt{d-c^2dx^2}\left(a+b\sin^{-1}(cx)\right)^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}}-\frac{15i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx}}{}$$

Mathematica [A]
time = 2.88, size = 477, normalized size = 0.68

Antiderivative was successfully verified.

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((120*a)/(b + b*n) + (120*ArcS
in[c*x])/(1 + n) - ((45*I)*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(2
^n*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((45*I)*E^(((2*I)*a)
/b)*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*((I*(a + b*ArcSin[c*x
]))/b)^n) - ((9*I)*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a +
b*ArcSin[c*x]))/b])/(4^n*E^(((4*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n) + (
(9*I)*E^(((4*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*
(a + b*ArcSin[c*x]))/b])/(4^n*((a + b*ArcSin[c*x])^2/b^2)^n) - (I*((I*(a +
b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*E^(
((6*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n) + (I*E^(((6*I)*a)/b)*(((-I)*(a
+ b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*((
a + b*ArcSin[c*x])^2/b^2)^n)))/(384*c*Sqrt[d - c^2*d*x^2])
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int\left(-c^2d\,x^2+d\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n, x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6189 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2),x)
[Out] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2), x)
```

3.495 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\textbf{ArcSin}(cx))^n}{x}\,dx$

Optimal. Leaf size=827

$$\frac{11d^3e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)^{-n}\text{Gamma}\left(1+n,-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{16\sqrt{d-c^2dx^2}}+\frac{11d^3e^{\frac{ia}{b}}}{}$$

```
[Out] 11/16*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1
)^(1/2)/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+11/16*
d^3*exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*x
^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)-5/32*3^(-1-n)*
d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1
/2)/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/8*d^3*
(a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/
(3^n)/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)-5/32*3
^(-1-n)*d^3*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x)
)/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/
8*d^3*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(
-c^2*x^2+1)^(1/2)/(3^n)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/
32*5^(-1-n)*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-5*I*(a+b*arcsin(c*x))/b)*(-c
^2*x^2+1)^(1/2)/exp(5*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1
/2)+1/32*5^(-1-n)*d^3*exp(5*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,5*I*(a+b*a
rcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d
)^(1/2)+d^3*Unintegrable((a+b*arcsin(c*x))^n/x/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [A]
time = 1.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^n}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] (11*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*A
rcSin[c*x]))/b])/(16*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c
*x]))/b)^n) + (11*d^3*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(16*Sqrt[d - c^2*d*x^2]*((I*(a + b*
ArcSin[c*x]))/b)^n) - (5*3^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(32*E^(((3*I)*a)/b)*Sqrt
[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (d^3*Sqrt[1 - c^2*x^2]*
```

```
(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*3^n*
E^(((3*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (5*
3^(-1 - n)*d^3*E^(((3*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/(32*Sqrt[d - c^2*d*x^2]*((I*(a + b
*ArcSin[c*x]))/b)^n) + (d^3*E^(((3*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/(8*3^n*Sqrt[d - c^2*d
*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (5^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^n*Gamma[1 + n, ((-5*I)*(a + b*ArcSin[c*x]))/b])/(32*E^(((
5*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (5^(-1 -
 n)*d^3*E^(((5*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n
, ((5*I)*(a + b*ArcSin[c*x]))/b])/(32*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin
[c*x]))/b)^n) + d^3*Defer[Int][(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]
), x]
```

Rubi steps

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\sin^{-1}(cx))^n}{x}\,dx=\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\sin^{-1}(cx))^n}{x}\,dx$$

Mathematica [A]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\text{ArcSin}(cx))^n}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x,x]
[Out] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [A]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{(-c^2d\,x^2+d)^{\frac{5}{2}}\,(a+b\arcsin(cx))^n}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x)
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n/x, x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n/x,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6190 deep
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^n\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x, x)
```

3.496 $\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\mathbf{ArcSin}(cx))^n}{x^2}\,dx$

Optimal. Leaf size=502

$$-\frac{15cd^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^{1+n}}{8b(1+n)\sqrt{d-c^2dx^2}}+\frac{i2^{-2-n}cd^3e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^n\left(-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$

```
[Out] -15/8*c*d^3*(a+b*arcsin(c*x))^(1+n)*(-c^2*x^2+1)^(1/2)/b/(1+n)/(-c^2*d*x^2+
d)^(1/2)+I*2^(-2-n)*c*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*
x))/b)*(-c^2*x^2+1)^(1/2)/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d
*x^2+d)^(1/2)-I*2^(-2-n)*c*d^3*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2
*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^
2*d*x^2+d)^(1/2)+I*c*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin(c*x
))/b)*(-c^2*x^2+1)^(1/2)/(2^(6+2*n))/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)
^n)/(-c^2*d*x^2+d)^(1/2)-I*c*d^3*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n
,4*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/(2^(6+2*n))/((I*(a+b*arcsin(c*
x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+d^3*Unintegrable((a+b*arcsin(c*x))^n/x^2/(-c
^2*d*x^2+d)^(1/2),x)
```

Rubi [A]
time = 0.88, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\text{ArcSin}(cx))^n}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] (-15*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*(1 + n)*Sqrt
[d - c^2*d*x^2]) + (I*2^(-2 - n)*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(E^(((2*I)*a)/b)*Sqrt[d -
 c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-2 - n)*c*d^3*E^(((2*
I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b
*ArcSin[c*x]))/b])/(Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I
*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(a + b*
ArcSin[c*x]))/b])/(2^(2*(3 + n))*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)
*(a + b*ArcSin[c*x]))/b)^n) - (I*c*d^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 +
 n))*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^3*Defer[Int][(a
 + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \sin^{-1}(cx))^n}{x^2} dx = \int \frac{(d - c^2dx^2)^{5/2} (a + b \sin^{-1}(cx))^n}{x^2} dx$$

Mathematica [A]
time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b\text{ArcSin}(cx))^n}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [A]
time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{(-c^2d\,x^2 + d)^{\frac{5}{2}} (a + b \arcsin(cx))^n}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

```
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n/x^2, x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n/x**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6190 deep
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,(d-c^2\,d\,x^2)^{5/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x^2, x)
```

3.497 $\int \frac{x^m \mathbf{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{x^m \mathrm{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m \mathrm{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
[Out] Defer[Int][(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\int \frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A]
time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{x^m \mathrm{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
[Out] Integrate[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2], x]
```

Maple [A]
time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \operatorname{asin}^n(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**m*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{asin}(a x)^n}{\sqrt{1 - a^2 x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^m*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.498 $\int \frac{x^3 \mathbf{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=163

$$-\frac{3(-i\text{ArcSin}(ax))^{-n}\text{ArcSin}(ax)^n\text{Gamma}(1+n,-i\text{ArcSin}(ax))}{8a^4}-\frac{3(i\text{ArcSin}(ax))^{-n}\text{ArcSin}(ax)^n\text{Gamma}(1+$$

```
[Out] -3/8*arcsin(a*x)^n*GAMMA(1+n,-I*arcsin(a*x))/a^4/((-I*arcsin(a*x))^n)-3/8*a
rcsin(a*x)^n*GAMMA(1+n,I*arcsin(a*x))/a^4/((I*arcsin(a*x))^n)+1/8*3^(-1-n)*
arcsin(a*x)^n*GAMMA(1+n,-3*I*arcsin(a*x))/a^4/((-I*arcsin(a*x))^n)+1/8*3^(-
1-n)*arcsin(a*x)^n*GAMMA(1+n,3*I*arcsin(a*x))/a^4/((I*arcsin(a*x))^n)
```

Rubi [A]

time = 0.17, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4809, 3393, 3389, 2212}

$$-\frac{3\text{ArcSin}(ax)^n(-i\text{ArcSin}(ax))^{-n}\text{Gamma}(n+1,-i\text{ArcSin}(ax))}{8a^4}+\frac{3^{-n-1}\text{ArcSin}(ax)^n(-i\text{ArcSin}(ax))^{-n}\text{Gamma}(n+1,-3i\text{ArcSin}(ax))}{8a^4}-\frac{3(i\text{ArcSin}(ax))^{-n}\text{ArcSin}(ax)^n\text{Gamma}(n+1,i\text{ArcSin}(ax))}{8a^4}+\frac{3^{-n-1}(i\text{ArcSin}(ax))^{-n}\text{ArcSin}(ax)^n\text{Gamma}(n+1,3i\text{ArcSin}(ax))}{8a^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(8*a^4*((-I)*ArcSin[a*x])
^n) - (3*ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(8*a^4*(I*ArcSin[a*x])^
n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (-3*I)*ArcSin[a*x]])/(8*a^4*((-
I)*ArcSin[a*x])^n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (3*I)*ArcSin[a*
x]])/(8*a^4*(I*ArcSin[a*x])^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^3 \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx &= \frac{\text{Subst}\left(\int x^n \sin^3(x)\,dx, x, \sin^{-1}(ax)\right)}{a^4}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{4}x^n \sin(x) - \frac{1}{4}x^n \sin(3x)\right)\,dx, x, \sin^{-1}(ax)\right)}{a^4}\\
&= -\frac{\text{Subst}\left(\int x^n \sin(3x)\,dx, x, \sin^{-1}(ax)\right)}{4a^4} + \frac{3\text{Subst}\left(\int x^n \sin(x)\,dx, x, \sin^{-1}(ax)\right)}{4a^4}\\
&= -\frac{i\text{Subst}\left(\int e^{-3ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{8a^4} + \frac{i\text{Subst}\left(\int e^{3ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{8a^4} + \frac{(3i)\text{Subs}}{}\\
&= -\frac{3(-i\sin^{-1}(ax))^{-n}\sin^{-1}(ax)^n\Gamma(1+n, -i\sin^{-1}(ax))}{8a^4} - \frac{3(i\sin^{-1}(ax))^{-n}\sin^{-1}(ax)^n}{8a^4}
\end{aligned}
$$

Mathematica [A]
time = 0.23, size = 153, normalized size = 0.94

$$
-\frac{3^{-1-n}\text{ArcSin}(ax)^n\left(\text{ArcSin}(ax)^2\right)^{-2n}\left(3^{2+n}(i\text{ArcSin}(ax))^n\left(\text{ArcSin}(ax)^2\right)^n\text{Gamma}(1+n,-i\text{ArcSin}(ax))+(-i\text{ArcSin}(ax))^n\left(3^{2+n}\left(\text{ArcSin}(ax)^2\right)^n\text{Gamma}(1+n,i\text{ArcSin}(ax))-(i\text{ArcSin}(ax))^{2n}\text{Gamma}(1+n,-3i\text{ArcSin}(ax))-\left(\text{ArcSin}(ax)^2\right)^n\text{Gamma}(1+n,3i\text{ArcSin}(ax))\right)\right)}{8a^4}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -1/8*(3^(-1 - n)*ArcSin[a*x]^n*(3^(2 + n)*(I*ArcSin[a*x])^n*(ArcSin[a*x]^2)
^n*Gamma[1 + n, (-I)*ArcSin[a*x]] + ((-I)*ArcSin[a*x])^n*(3^(2 + n)*(ArcSin
[a*x]^2)^n*Gamma[1 + n, I*ArcSin[a*x]] - (I*ArcSin[a*x])^(2*n)*Gamma[1 + n,
 (-3*I)*ArcSin[a*x]] - (ArcSin[a*x]^2)^n*Gamma[1 + n, (3*I)*ArcSin[a*x]])))
/(a^4*(ArcSin[a*x]^2)^(2*n))
```

Maple [F]
time = 0.39, size = 0, normalized size = 0.00

$$
\int \frac{x^3 \arcsin\left(ax\right)^n}{\sqrt{-a^2x^2+1}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^3*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \operatorname{asin}^n(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**3*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3 \operatorname{asin}(a x)^n}{\sqrt{1-a^2 x^2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^3*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.499 $\int \frac{x^2 \mathbf{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}} \, dx$

Optimal. Leaf size=109

$$\frac{\text{ArcSin}(ax)^{1+n}}{2a^3(1+n)}+\frac{i2^{-3-n}(-i\text{ArcSin}(ax))^{-n}\text{ArcSin}(ax)^n\text{Gamma}(1+n,-2i\text{ArcSin}(ax))}{a^3}-\frac{i2^{-3-n}(i\text{ArcSin}(ax)$$

```
[Out] 1/2*arcsin(a*x)^(1+n)/a^3/(1+n)+I*2^(-3-n)*arcsin(a*x)^n*GAMMA(1+n,-2*I*arc
sin(a*x))/a^3/((-I*arcsin(a*x))^n)-I*2^(-3-n)*arcsin(a*x)^n*GAMMA(1+n,2*I*a
rcsin(a*x))/a^3/((I*arcsin(a*x))^n)
```

Rubi [A]
time = 0.14, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4809, 3393, 3388, 2212}

$$\frac{i2^{-n-3}\text{ArcSin}(ax)^n(-i\text{ArcSin}(ax))^{-n}\text{Gamma}(n+1,-2i\text{ArcSin}(ax))}{a^3}-\frac{i2^{-n-3}(i\text{ArcSin}(ax))^{-n}\text{ArcSin}(ax)^n\text{Gamma}(n+1,2i\text{ArcSin}(ax))}{a^3}+\frac{\text{ArcSin}(ax)^{n+1}}{2a^3(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(2*a^3*(1 + n)) + (I*2^(-3 - n)*ArcSin[a*x]^n*Gamma[1 +
 n, (-2*I)*ArcSin[a*x]])/(a^3*((-I)*ArcSin[a*x])^n) - (I*2^(-3 - n)*ArcSin[
a*x]^n*Gamma[1 + n, (2*I)*ArcSin[a*x]])/(a^3*(I*ArcSin[a*x])^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2 \sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx &= \frac{\text{Subst}\left(\int x^n \sin^2(x)\,dx, x, \sin^{-1}(ax)\right)}{a^3} \\
&= \frac{\text{Subst}\left(\int \left(\frac{x^n}{2} - \frac{1}{2}x^n \cos(2x)\right)\,dx, x, \sin^{-1}(ax)\right)}{a^3} \\
&= \frac{\sin^{-1}(ax)^{1+n}}{2a^3(1+n)} - \frac{\text{Subst}\left(\int x^n \cos(2x)\,dx, x, \sin^{-1}(ax)\right)}{2a^3} \\
&= \frac{\sin^{-1}(ax)^{1+n}}{2a^3(1+n)} - \frac{\text{Subst}\left(\int e^{-2ix} x^n\,dx, x, \sin^{-1}(ax)\right)}{4a^3} - \frac{\text{Subst}\left(\int e^{2ix} x^n\,dx, x, \sin^{-1}(ax)\right)}{4a^3} \\
&= \frac{\sin^{-1}(ax)^{1+n}}{2a^3(1+n)} + \frac{i2^{-3-n}\left(-i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\Gamma\left(1+n,-2i\sin^{-1}(ax)\right)}{a^3} - \frac{i2^{-3-n}}{}
\end{aligned}$$

Mathematica [A]
time = 0.18, size = 109, normalized size = 1.00

$$\frac{2^{-3-n}\text{ArcSin}(ax)^n\left(\text{ArcSin}(ax)^2\right)^{-n}\left(2^{2+n}\text{ArcSin}(ax)\left(\text{ArcSin}(ax)^2\right)^n + i(1+n)(i\text{ArcSin}(ax))^n\text{Gamma}(1+n,-2i\text{ArcSin}(ax)) - i(1+n)(-i\text{ArcSin}(ax))^n\text{Gamma}(1+n,2i\text{ArcSin}(ax))\right)}{a^3(1+n)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2^(-3 - n)*ArcSin[a*x]^n*(2^(2 + n)*ArcSin[a*x]*(ArcSin[a*x]^2)^n + I*(1 +
 n)*(I*ArcSin[a*x])^n*Gamma[1 + n, (-2*I)*ArcSin[a*x]] - I*(1 + n)*((-I)*Ar
cSin[a*x])^n*Gamma[1 + n, (2*I)*ArcSin[a*x]]))/(a^3*(1 + n)*(ArcSin[a*x]^2)
^n)
```

Maple [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arcsin(ax)^n}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \operatorname{asin}^n(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**2*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^2*arcsin(a*x)^n/sqrt(-a^2*x^2 + 1), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 \operatorname{asin}(a\,x)^n}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^2*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.500 $\int \frac{x\mathbf{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=75

$$-\frac{(-i\mathrm{ArcSin}(ax))^{-n}\mathrm{ArcSin}(ax)^n\mathrm{Gamma}(1+n,-i\mathrm{ArcSin}(ax))}{2a^2}-\frac{(i\mathrm{ArcSin}(ax))^{-n}\mathrm{ArcSin}(ax)^n\mathrm{Gamma}(1+n}{2a^2}$$

```
[Out] -1/2*arcsin(a*x)^n*GAMMA(1+n,-I*arcsin(a*x))/a^2/((-I*arcsin(a*x))^n)-1/2*a
rcsin(a*x)^n*GAMMA(1+n,I*arcsin(a*x))/a^2/((I*arcsin(a*x))^n)
```

Rubi [A]
time = 0.08, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4809, 3389, 2212}

$$-\frac{\mathrm{ArcSin}(ax)^n(-i\mathrm{ArcSin}(ax))^{-n}\mathrm{Gamma}(n+1,-i\mathrm{ArcSin}(ax))}{2a^2}-\frac{(i\mathrm{ArcSin}(ax))^{-n}\mathrm{ArcSin}(ax)^n\mathrm{Gamma}(n+1,i\mathrm{ArcSin}(ax))}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -1/2*(ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(a^2*((-I)*ArcSin[a*x])
^n) - (ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(2*a^2*(I*ArcSin[a*x])^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x\sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \frac{\text{Subst}\left(\int x^n\sin(x)\,dx, x, \sin^{-1}(ax)\right)}{a^2}$$
$$= \frac{i\text{Subst}\left(\int e^{-ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{2a^2} - \frac{i\text{Subst}\left(\int e^{ix}x^n\,dx, x, \sin^{-1}(ax)\right)}{2a^2}$$
$$= -\frac{\left(-i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\Gamma(1+n, -i\sin^{-1}(ax))}{2a^2} - \frac{\left(i\sin^{-1}(ax)\right)^{-n}\sin^{-1}(ax)^n\Gamma(1}{2a^2}$$

Mathematica [A]
time = 0.05, size = 70, normalized size = 0.93

$$-\frac{\text{ArcSin}(ax)^n\left(\text{ArcSin}(ax)^2\right)^{-n}\left((i\text{ArcSin}(ax))^n\text{Gamma}(1+n, -i\text{ArcSin}(ax)) + (-i\text{ArcSin}(ax))^n\text{Gamma}(1+n, i\text{ArcSin}(ax))\right)}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -1/2*(ArcSin[a*x]^n*((I*ArcSin[a*x])^n*Gamma[1 + n, (-I)*ArcSin[a*x]] + ((-
I)*ArcSin[a*x])^n*Gamma[1 + n, I*ArcSin[a*x]]))/(a^2*(ArcSin[a*x]^2)^n)
```

Maple [F]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{x\arcsin(ax)^n}{\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{asin}^{n}(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x*arcsin(a*x)^n/sqrt(-a^2*x^2 + 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\mathrm{asin}\left(a\,x\right)}^n}{\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.501 $\int \frac{\mathbf{ArcSin}(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=17

$$\frac{\text{ArcSin}(ax)^{1+n}}{a(1+n)}$$

[Out] arcsin(a*x)^(1+n)/a/(1+n)

Rubi [A]
time = 0.03, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {4737}

$$\frac{\text{ArcSin}(ax)^{n+1}}{a(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[ArcSin[a*x]^n/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(a*(1 + n))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \frac{\sin^{-1}(ax)^{1+n}}{a(1+n)}$$

Mathematica [A]
time = 0.01, size = 17, normalized size = 1.00

$$\frac{\text{ArcSin}(ax)^{1+n}}{a(1+n)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcSin[a*x]^n/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(a*(1 + n))
```

Maple [A]
time = 0.11, size = 18, normalized size = 1.06

method	result	size
derivativedivides	$\frac{\arcsin(ax)^{1+n}}{a(1+n)}$	18
default	$\frac{\arcsin(ax)^{1+n}}{a(1+n)}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] arcsin(a*x)^(1+n)/a/(1+n)
```

Maxima [A]
time = 0.48, size = 17, normalized size = 1.00

$$\frac{\arcsin{(ax)}^{n+1}}{a(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] arcsin(a*x)^(n + 1)/(a*(n + 1))
```

Fricas [A]
time = 2.21, size = 18, normalized size = 1.06

$$\frac{\arcsin{(ax)}^{n}\arcsin{(ax)}}{an+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] arcsin(a*x)^n*arcsin(a*x)/(a*n + a)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 34 vs. $2(12) = 24$.
time = 0.36, size = 34, normalized size = 2.00

$$\begin{cases} \tilde{\infty}x & \text{for } a = 0 \wedge n = -1 \\ 0^{n}x & \text{for } a = 0 \\ \frac{\log{(\operatorname{asin}{(ax)})}}{a} & \text{for } n = -1 \\ \frac{\operatorname{asin}{(ax)}\operatorname{asin}^{n}{(ax)}}{an+a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((zoo*x, Eq(a, 0) & Eq(n, -1)), (0**n*x, Eq(a, 0)), (log(asin(a*x)
)/a, Eq(n, -1)), (asin(a*x)*asin(a*x)**n/(a*n + a), True))
```

Giac [A]
time = 0.41, size = 17, normalized size = 1.00

$$\frac{\arcsin(ax)^{n+1}}{a(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] arcsin(a*x)^(n + 1)/(a*(n + 1))
```

Mupad [B]
time = 0.31, size = 33, normalized size = 1.94

$$\begin{cases} \frac{\ln(\mathrm{asin}(a\,x))}{a} & \text{if } n=-1 \\ \frac{\mathrm{asin}(a\,x)^{n+1}}{a\,(n+1)} & \text{if } n\neq -1 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^n/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] piecewise(n == -1, log(asin(a*x))/a, n ~= -1, asin(a*x)^(n + 1)/(a*(n + 1))
)
```

3.502 $\int \frac{\text{ArcSin}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\text{ArcSin}(ax)^n}{x\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\text{ArcSin}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]),x]
[Out] Defer[Int][ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]), x]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\sin^{-1}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A]
time = 2.35, size = 0, normalized size = 0.00

$$\int \frac{\text{ArcSin}(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]),x]
[Out] Integrate[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]), x]
```

Maple [A]
time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{\arcsin(ax)^n}{x\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^n/(a^2*x^3 - x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{n}\left(ax\right)}{x\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**n/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**n/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^n/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\operatorname{asin}(a\,x)^n}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^n/(x*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^n/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.503 $\int \frac{\mathbf{ArcSin}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal. Leaf size=27

$$\operatorname{Int}\left(\frac{\operatorname{ArcSin}(ax)^n}{x^2\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\operatorname{ArcSin}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]),x]
[Out] Defer[Int][ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]), x]
```

Rubi steps

$$\int \frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\sin^{-1}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

Mathematica [A]
time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{ArcSin}(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]),x]
[Out] Integrate[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]), x]
```

Maple [A]
time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{\arcsin\left(ax\right)^n}{x^2\sqrt{-a^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^n/(a^2*x^4 - x^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{asin}^{n}(ax)}{x^{2}\sqrt{-(ax-1)(ax+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(asin(a*x)**n/x**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**n/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^n/(sqrt(-a^2*x^2 + 1)*x^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\operatorname{asin}(a\,x)^n}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(asin(a*x)^n/(x^2*(1 - a^2*x^2)^(1/2)),x)
```

```
[Out] int(asin(a*x)^n/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.504 $\int (d+cdx)^{5/2}\sqrt{f-cfx}\,(a+b\textbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=376

$$\frac{2bd^2x\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{3bcd^2x^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}-\frac{2bc^2d^2x^3\sqrt{d+cdx}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}-\frac{bc^3d^2x^4\sqrt{d+}}{16\sqrt{}}$$

```
[Out] 3/8*d^2*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+1/4*c^2*d^2*x^
3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)-2/3*d^2*(-c^2*x^2+1)*(
a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c+2/3*b*d^2*x*(c*d*x+d)^(
1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*c*d^2*x^2*(c*d*x+d)^(1/2)*(
-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-2/9*b*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^3*d^2*x^4*(c*d*x+d)^(1/2)*(-c*f*x+f)
^(1/2)/(-c^2*x^2+1)^(1/2)+5/16*d^2*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*
f*x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.39, antiderivative size = 376, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 4847, 4741, 4737, 30, 4767, 4783, 4795}

$$\frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))+\frac{5d^2\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))^2}{16bc\sqrt{1-c^2x^2}}-\frac{2d^2(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{3c}+\frac{3}{8}d^2x\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))-\frac{3bcd^2x^2\sqrt{cdx+d}\,\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}+\frac{2bd^2x\sqrt{cdx+d}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{2bc^2d^2x^3\sqrt{cdx+d}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}-\frac{bc^3d^2x^4\sqrt{cdx+d}\,\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c*
d^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) - (2*b*c^2*
d^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2
*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*d^2*x*Sqr
t[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*d^2*x^3*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 - (2*d^2*Sqrt[d + c*d*x]*Sqr
t[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*d^2*Sqrt[d + c*d
*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int (d+cdx)^2\sqrt{1-c^2x^2}\,(a+b\sin}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int \left(d^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\right)}{}$$

$$= \frac{\left(d^2\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}d^2x\sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}c^2d^2x^3\sqrt{d}$$

$$= \frac{2bd^2x\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcd^2x^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{3bcd^2x^2\sqrt{d+cdx}\,\sqrt{f-cf}}{16\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.85, size = 293, normalized size = 0.78

$$\frac{360bd^2\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-720ad^{5/2}\sqrt{f}\,\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+d^2\sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(-256bcx(-3+c^2x^2)+48a\sqrt{1-c^2x^2}\,(-16+9cx+16c^2x^2+6c^3x^3)+144b\cos(2\text{ArcSin}(cx))-9b\cos(4\text{ArcSin}(cx))\right)+12bd^2\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)\left(-64(1-c^2x^2)^{3/2}+24\sin(2\text{ArcSin}(cx))-3\sin(4\text{ArcSin}(cx))\right)}{1152c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (360*b*d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*d^(5/2)*Sq
rt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] + d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-256*b*c
*x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(-16 + 9*c*x + 16*c^2*x^2 + 6*c^
3*x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) + 12*b*d^2*Sqrt
[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) + 24*Sin[2
*ArcSin[c*x]] - 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{5}{2}} (a+b\arcsin (cx)) \sqrt{-cfx+f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/24*(15*sqr
t(-c^2*d*f*x^2 + d*f)*d^2*x + 15*d^3*f*arcsin(c*x)/(sqrt(d*f)*c) - 6*(-c^2*
d*f*x^2 + d*f)^(3/2)*d*x/f - 16*(-c^2*d*f*x^2 + d*f)^(3/2)*d/(c*f))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2*
x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6188 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
[Out] integrate((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{asin}(c\,x))\;(d + c\,d\,x)^{5/2}\,\sqrt{f - c\,f\,x}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(1/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(1/2), x)
```

3.505 $\int (d+cdx)^{3/2}\sqrt{f-cfx}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=273

$$\frac{bdx\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcdx^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}-\frac{bc^2dx^3\sqrt{d+cdx}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}dx\sqrt{d+cdx}\,\sqrt{.}$$

```
[Out] 1/2*d*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)-1/3*d*(-c^2*x^2+
1)*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c+1/3*b*d*x*(c*d*x+d)
^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/4*b*c*d*x^2*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c^2*d*x^3*(c*d*x+d)^(1/2)*(-c*f*x+f
)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*d*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.21, antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 4847, 4741, 4737, 30, 4767}

$$\frac{d\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{1-c^2x^2}}-\frac{d(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{3c}+\frac{1}{2}dx\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))-\frac{bcdx^2\sqrt{cdx+d}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}+\frac{bdx\sqrt{cdx+d}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bc^2dx^3\sqrt{cdx+d}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*
Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) - (b*c^2*d*x^3*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 - (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x
]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
```

```
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}\int (d+cdx)^{3/2}\sqrt{f-cfx}\,\left(a+b\sin^{-1}(cx)\right)\,dx &= \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int (d+cdx)\sqrt{1-c^2x^2}\,(a+b\sin}{\sqrt{1-c^2x^2}}\\ &= \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int \Big(d\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\\ &= \frac{\left(d\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\\ &= \frac{1}{2}dx\sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(a+b\sin^{-1}(cx)\right)-\frac{d\sqrt{d+cdx}}{}\\ &= \frac{bdx\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcdx^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}\end{aligned}$$

Mathematica [A]
time = 0.55, size = 260, normalized size = 0.95

$$\frac{18bd\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-36ad^{3/2}\sqrt{f}\,\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+d\sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(-8bcx(-3+c^2x^2)+12a\sqrt{1-c^2x^2}\,(-2+3cx+2c^2x^2)+9b\cos(2\text{ArcSin}(cx))\right)+6bd\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)\left(-4(1-c^2x^2)^{3/2}+3\sin(2\text{ArcSin}(cx))\right)}{72c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (18*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*d^(3/2)*Sqrt[f
]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*S
qrt[f]*(-1 + c^2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-8*b*c*x*(-3 +
 c^2*x^2) + 12*a*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x + 2*c^2*x^2) + 9*b*Cos[2*Arc
Sin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-4*(1 - c^2
*x^2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{3}{2}}\left(a+b\arcsin(cx)\right)\sqrt{-cfx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c*d*x + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/6*(3*sqrt(-c^2*d*f*x^2 + d*f)*
d*x + 3*d^2*f*arcsin(c*x)/(sqrt(d*f)*c) - 2*(-c^2*d*f*x^2 + d*f)^(3/2)/(c*f
))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt
(-c*f*x + f), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (d(cx+1))^{\frac{3}{2}} \sqrt{-f(cx-1)} (a+b\operatorname{asin}(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*sqrt(-f*(c*x - 1))*(a + b*asin(c*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\operatorname{asin}(c\,x))\, (d+c\,d\,x)^{3/2}\, \sqrt{f-c\,f\,x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(1/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(1/2), x)
```

3.506 $\int \sqrt{d+cdx}\,\sqrt{f-cfx}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=134

$$-\frac{bcx^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d+cdx}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))+\frac{\sqrt{d+cdx}\,\sqrt{f-cfx}\,(a+b\text{ArcS}}{4bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)-1/4*b*c*x^2*(c*d*x
+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*(a+b*arcsin(c*x))^2*(c*d*
x+d)^(1/2)*(-c*f*x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {4763, 4741, 4737, 30}

$$\frac{\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))-\frac{bcx^2\sqrt{cdx+d}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(b*c*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/Sqrt[1 - c^2*x^2] + (x*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}x\sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(a+b\sin^{-1}(cx)\right) + \frac{\left(\sqrt{d+cdx}\,\sqrt{\right.}{}}{}$$

$$= -\frac{bcx^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\,\sqrt{f-cfx}\,(a$$

Mathematica [A]
time = 0.31, size = 207, normalized size = 1.54

$$\frac{1}{2}ax\sqrt{-f(-1+cx)}\,\sqrt{d(1+cx)} - \frac{a\sqrt{d}\,\sqrt{f}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{-f(-1+cx)}\,\sqrt{d(1+cx)}}{\sqrt{d}\,\sqrt{f}\,(-1+cx)(1+cx)}\right)}{2c} + \frac{b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\sqrt{-df\,(1-c^2x^2)}\,\left(\cos(2\mathrm{ArcSin}(cx))+2\mathrm{ArcSin}(cx)(\mathrm{ArcSin}(cx)+\sin(2\mathrm{ArcSin}(cx)))\right)}{8c\sqrt{(-d-cdx)(f-cfx)}\,\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (a*x*Sqrt[-(f*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/2 - (a*Sqrt[d]*Sqrt[f]*ArcTan
[(c*x*Sqrt[-(f*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[f]*(-1 + c*x)*
(1 + c*x))])/(2*c) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[-(d*f*(1 - c^2
*x^2))]*(Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x] + Sin[2*ArcSin[c*x
]])))/(8*c*Sqrt[(-d - c*d*x)*(f - c*f*x)]*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \sqrt{cdx+d}\,\left(a+b\arcsin\left(cx\right)\right)\sqrt{-cfx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)), x) + 1/2*(sqrt(-c^2*d*f*x^2 + d*f)*x + d*f*arcsin
(c*x)/(sqrt(d*f)*c))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d\,(cx+1)}\,\sqrt{-f\,(cx-1)}\,(a+b\operatorname{asin}(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))*(a + b*asin(c*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}\,\sqrt{f-c\,f\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(1/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(1/2), x)
```

3.507 $\int \frac{\sqrt{f-cfx}\,(a+b\mathbf{ArcSin}(cx))}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=141

$$-\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{f(1-c^2x^2)\,(a+b\mathrm{ArcSin}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{f\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))^2}{2bc\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

```
[Out] f*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-b*f*x*(
-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/2*f*(a+b*arcsin(c*x))^
2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4763, 4847, 4737, 4767, 8}

$$\frac{f\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))^2}{2bc\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{f(1-c^2x^2)\,(a+b\mathrm{ArcSin}(cx))}{c\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\,\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] -((b*f*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x])) + (f*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (f*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sqrt{f-cfx}\,(a+b\sin^{-1}(cx))}{\sqrt{d+cdx}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}-\frac{cfx(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} \\
&= \frac{\left(f\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{\left(cf\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,\cdots}{\sqrt{d+cdx}\,\sqrt{f-cfx}} \\
&= \frac{f(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{f\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{2bc\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{(bf\cdots}{\sqrt{d\cdots}} \\
&= -\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{f(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{f\sqrt{1-c^2\cdots}}{2bc\sqrt{d\cdots}}
\end{aligned}
$$

Mathematica [A]
time = 0.39, size = 200, normalized size = 1.42

$$\frac{\frac{2\sqrt{d+cdx}\,\sqrt{f-cfx}\left(-bcx+a\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}}+2b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\mathrm{ArcSin}(cx)+\frac{b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\mathrm{ArcSin}(cx)^2}{\sqrt{1-c^2x^2}}-2a\sqrt{d}\,\sqrt{f}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)}{2cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] ((2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-(b*c*x) + a*Sqrt[1 - c^2*x^2]))/Sqrt[
1 - c^2*x^2] + 2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x] + (b*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 2*a*Sqrt[d]*Sqr
t[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^
2*x^2))])/(2*c*d)
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))\sqrt{-cfx+f}}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] a*(f*arcsin(c*x)/(c*d*sqrt(f/d)) + sqrt(-c^2*d*f*x^2 + d*f)/(c*d)) + b*sqrt
(f)*integrate(sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqr
t(c*x + 1), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-f(cx-1)}\,(a+b\operatorname{asin}(cx))}{\sqrt{d(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(1/2),x)
```

```
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/sqrt(d*(c*x + 1)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{\sqrt{d+c\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(1/2), x)
```

3.508 $\int \frac{\sqrt{f-cfx}\,(a+b\mathbf{ArcSin}(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=162

$$-\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{f^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{2bf^2\left(1-c^2x^2\right)^{3/2}\log(1+c}{c(d+cdx)^{3/2}(f-cfx)^{3}}$$

```
[Out] -2*f^2*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)
^(3/2)-1/2*f^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(
-c*f*x+f)^(3/2)+2*b*f^2*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(-c*
f*x+f)^(3/2)
```

Rubi [A]
time = 0.26, antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737}

$$-\frac{f^2\left(1-c^2x^2\right)^{3/2}(a+b\text{ArcSin}(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2bf^2\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (-2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(
f - c*f*x)^(3/2)) - (f^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*f^2*(1 - c^2*x^2)^(3/2)*Log[1 +
 c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\sqrt{f-cfx}\,(a+b\sin^{-1}(cx))}{(d+cdx)^{3/2}}\,dx = \frac{(1-c^2x^2)^{3/2}\int \frac{(f-cfx)^2(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{2(f^2-cf^2x)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}} - \frac{f^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(2(1-c^2x^2)^{3/2}\right)\int \frac{(f^2-cf^2x)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(f^2(1-c^2x^2)^{3/2}\right)\int \frac{a+b}{\sqrt{1}}}{(d+cdx)^{3/2}(f-c}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2(1-c^2x^2)^{3/2}(a+b\sin}{2bc(d+cdx)^{3/2}(f-cf}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2(1-c^2x^2)^{3/2}(a+b\sin}{2bc(d+cdx)^{3/2}(f-cf}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2(1-c^2x^2)^{3/2}(a+b\sin}{2bc(d+cdx)^{3/2}(f-cf}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2(1-c^2x^2)^{3/2}(a+b\sin}{2bc(d+cdx)^{3/2}(f-cf}$$

Mathematica [**A**]
time = 0.74, size = 248, normalized size = 1.53

$$-\frac{\frac{4a\sqrt{d+cdx}\sqrt{f-cfx}}{1+cx} - 2a\sqrt{d}\sqrt{f}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) + \frac{b\sqrt{d+cdx}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\left(\mathrm{ArcSin}(cx)(4+\mathrm{ArcSin}(cx)) - 8\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)\right) + \left((-4+\mathrm{ArcSin}(cx))\mathrm{ArcSin}(cx) - 8\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)\right)\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] -1/2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x) - 2*a*Sqrt[d]*Sqrt[f]
*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^
2))] + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*
(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4
+ ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]
)*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2])))/(c*d^2)
```

Maple [**F**]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))\sqrt{-cfx+f}}{(cdx+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] -a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^2*x + c*d^2) + f*arcsin(c*x)/(c*d^2*s
qrt(f/d))) + b*sqrt(f)*integrate(sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))/((c*d*x + d)*sqrt(c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d^2*x^2
+ 2*c*d^2*x + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-f\left(cx-1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}{\left(d\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(3/2),x)
```

```
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/(d*(c*x + 1))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{(d+c\,d\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(3/2), x)
```

3.509 $\int \frac{\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=163

$$-\frac{2bf^3(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{bf^3(1-c^2x^2)^{5/2}\log(1+\dots}{3c(d+cdx)^{5/2}(f-cfx)\dots}$$

```
[Out] -2/3*b*f^3*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1/
3*f^3*(-c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)-1/3*b*f^3*(-c^2*x^2+1)^(5/2)*ln(c*x+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)
```

Rubi [A]
time = 0.19, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 665, 4845, 12, 641, 45}

$$-\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2bf^3(1-c^2x^2)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^3(1-c^2x^2)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (-2*b*f^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (f^3*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*f^3*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
```

```
rQ[m + p]))
```

Rule 665

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^m*((a + c*x^2)^(p + 1)/(2*c*d*(p + 1))), x] /; FreeQ[{a, c, d,
e, m, p}, x] && EqQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p] && EqQ[m + 2*p + 2,
0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{\sqrt{f-cfx}\,(a+b\sin^{-1}(cx))}{(d+cdx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(f-cfx)^3(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int -\frac{f^3}{3c(}}{(d+cdx)^{5/2}(f-cf}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3(1-c^2x^2)^{5/2}\right)\int \frac{(1-}{(1-}}{3(d+cdx)^{5/2}(f-cf}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3(1-c^2x^2)^{5/2}\right)\int \frac{1-}{(1+}}{3(d+cdx)^{5/2}(f-cfx}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3(1-c^2x^2)^{5/2}\right)\int \Big(-}{3(d+cdx)^{5/2}(f}$$

$$= -\frac{2bf^3(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b}{3c(d+cdx)^{5/2}(f-cf}$$

Mathematica [A]
time = 0.27, size = 114, normalized size = 0.70

$$-\frac{f\sqrt{d+cdx}\left((-1+cx)\left(-a+acx-b\sqrt{1-c^2x^2}\right)+b(-1+cx)^2\mathrm{ArcSin}(cx)+b(1+cx)\sqrt{1-c^2x^2}\,\log(-f(1+cx))\right)}{3cd^3(1+cx)^2\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] -1/3*(f*Sqrt[d + c*d*x]*((-1 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b*
(-1 + c*x)^2*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))
]))/(c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))\sqrt{-cfx+f}}{(cdx+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x)
```

Maxima [A]
time = 0.50, size = 215, normalized size = 1.32

$$-\frac{1}{3}\,bc\left(\frac{2\,\sqrt{f}}{c^{3}d^{\frac{5}{2}}x+c^{2}d^{\frac{5}{2}}}+\frac{\sqrt{f}\,\log\left(cx+1\right)}{c^{2}d^{\frac{5}{2}}}\right)-\frac{1}{3}\,b\left(\frac{2\,\sqrt{-c^{2}dfx^{2}+df}}{c^{3}d^{3}x^{2}+2\,c^{2}d^{3}x+cd^{3}}-\frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{2}d^{3}x+cd^{3}}\right)\arcsin\left(cx\right)-\frac{1}{3}\,a\left(\frac{2\,\sqrt{-c^{2}dfx^{2}+df}}{c^{3}d^{3}x^{2}+2\,c^{2}d^{3}x+cd^{3}}-\frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{2}d^{3}x+cd^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] -1/3*b*c*(2*sqrt(f)/(c^3*d^(5/2)*x + c^2*d^(5/2)) + sqrt(f)*log(c*x + 1)/(c
^2*d^(5/2))) - 1/3*b*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*x^2 + 2*c^2*d^3*x
 + c*d^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*x + c*d^3))*arcsin(c*x) - 1/3
*a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - sqrt(-
c^2*d*f*x^2 + d*f)/(c^2*d^3*x + c*d^3))
```

Fricas [A]
time = 3.50, size = 520, normalized size = 3.19

$$\left[\frac{\left(bc^{3}dx^{3}+bc^{2}dx^{2}-bcdx-bd\right)\sqrt{\frac{f}{d}}\,\log\left(\frac{c^{6}fx^{6}+4c^{5}fx^{5}+5c^{4}fx^{4}-4c^{2}fx^{2}-4cfx+\left(c^{4}x^{4}+4c^{3}x^{3}+6c^{2}x^{2}+4cx\right)\sqrt{-c^{2}x^{2}+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{\frac{f}{d}}-2f}{c^{4}x^{4}+2c^{3}x^{3}-2cx-1}\right)+2\left(ac^{2}x^{2}-2\sqrt{-c^{2}x^{2}+1}\,bcx-2acx+\left(bc^{2}x^{2}-2\,bcx+b\right)\arcsin\left(cx\right)+a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{6\left(c^{4}d^{3}x^{3}+c^{3}d^{3}x^{2}-c^{2}d^{3}x-cd^{3}\right)},-\frac{\left(bc^{3}dx^{3}+bc^{2}dx^{2}-bcdx-bd\right)\sqrt{-\frac{f}{d}}\,\arctan\left(\frac{\left(c^{2}x^{2}+2cx+2\right)\sqrt{-c^{2}x^{2}+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{-\frac{f}{d}}}{c^{4}fx^{4}+2c^{3}fx^{3}-c^{2}fx^{2}-2cfx}\right)-\left(ac^{2}x^{2}-2\sqrt{-c^{2}x^{2}+1}\,bcx-2acx+\left(bc^{2}x^{2}-2\,bcx+b\right)\arcsin\left(cx\right)+a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{3\left(c^{4}d^{3}x^{3}+c^{3}d^{3}x^{2}-c^{2}d^{3}x-cd^{3}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(f/d)*log((c^6*f*x^6
+ 4*c^5*f*x^5 + 5*c^4*f*x^4 - 4*c^2*f*x^2 - 4*c*f*x + (c^4*x^4 + 4*c^3*x^3
+ 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sq
rt(f/d) - 2*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) + 2*(a*c^2*x^2 - 2*sqrt(-
c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*arcsin(c*x) + a)*s
qrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x^2 - c^2*d^3*x - c
*d^3), -1/3*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(-f/d)*arctan(
(c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*s
qrt(-f/d)/(c^4*f*x^4 + 2*c^3*f*x^3 - c^2*f*x^2 - 2*c*f*x)) - (a*c^2*x^2 - 2
*sqrt(-c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*arcsin(c*x)
 + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x^2 - c^2*d^
3*x - c*d^3)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-f\left(cx-1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}{\left(d\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(5/2),x)
```

```
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/(d*(c*x + 1))**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{{(d+c\,d\,x)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(5/2), x)
```

3.510 $\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=414

$$\frac{bdx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}}-\frac{5bcdx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^2dx^3(d+cdx)^{3/2}(f-cfx)^{3/2}}{15\left(1-c^2x^2\right)^{3/2}}+\frac{bc^3dx^4(d}{1}$$

```
[Out] 1/5*b*d*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-5/16*b*c*d*x^
2*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-2/15*b*c^2*d*x^3*(c*d
*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/16*b*c^3*d*x^4*(c*d*x+d)^
(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/25*b*c^4*d*x^5*(c*d*x+d)^(3/2)*
(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/4*d*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2
)*(a+b*arcsin(c*x))+3/8*d*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*
x))/(-c^2*x^2+1)-1/5*d*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(-c^2*x^2+1)*(a+b*a
rcsin(c*x))/c+3/16*d*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))^2/b
/c/(-c^2*x^2+1)^(3/2)
```

Rubi [A]
time = 0.28, antiderivative size = 414, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4763, 4847, 4743, 4741, 4737, 30, 14, 4767, 200}

$$\frac{3dx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{8\left(1-c^2x^2\right)}+\frac{3d(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))^2}{16bc\left(1-c^2x^2\right)^{3/2}}-\frac{d\left(1-c^2x^2\right)(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{5c}+\frac{1}{4}dx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))-\frac{5bcdx^2(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}+\frac{bdx(cdx+d)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^2dx^3(cdx+d)^{3/2}(f-cfx)^{3/2}}{15\left(1-c^2x^2\right)^{3/2}}+\frac{bc^4dx^5(cdx+d)^{3/2}(f-cfx)^{3/2}}{25\left(1-c^2x^2\right)^{3/2}}+\frac{bc^3dx^4(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(5*(1 - c^2*x^2)^(3/2)) - (5*b*
c*d*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) - (2*
b*c^2*d*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*d*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2))
 + (b*c^4*d*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/2
)) + (d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2
)) - (d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x
]))/(5*c) + (3*d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)
/(16*b*c*(1 - c^2*x^2)^(3/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int (d+cdx)\left(1-c^2x^2\right)^{3/2}(a+}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(d\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}\right.\right.}{\left(1-c^2x^2\right)^{3/}}$$

$$= \frac{\left(d(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right) - \frac{d(d+c}{}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right) + \frac{3dx(d+}{}$$

$$= \frac{bdx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}} - \frac{5bcdx^2(d+cdx)^{3/2}(f-c}{16\left(1-c^2x^2\right)^{3/2}}$$

Mathematica [A]
time = 0.94, size = 305, normalized size = 0.74

$$\frac{d^2f\left(1800b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-3600a\sqrt{d}\,\sqrt{f}\,\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+\sqrt{d+cdx}\,\sqrt{f-cfx}\left(128bcx(15-10c^2x^2+3c^4x^4)-240a\sqrt{1-c^2x^2}\,(8-25cx-16c^2x^2+10c^3x^3+8c^4x^4)+1200b\cos(2\text{ArcSin}(cx))+75b\cos(4\text{ArcSin}(cx))\right)-60b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)\left(32(1-c^2x^2)^{5/2}-40\sin(2\text{ArcSin}(cx))-5\sin(4\text{ArcSin}(cx))\right)\right)}{9600c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*f*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(128*b*c
*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) - 240*a*Sqrt[1 - c^2*x^2]*(8 - 25*c*x - 16
```

```
*c^2*x^2 + 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b*Cos[4
*ArcSin[c*x]]) - 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(32*(1 -
c^2*x^2)^(5/2) - 40*Sin[2*ArcSin[c*x]] - 5*Sin[4*ArcSin[c*x]])))/(9600*c*Sq
rt[1 - c^2*x^2])
```

Maple [**F**]
time = 0.12, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{5}{2}} (-cfx+f)^{\frac{3}{2}} (a+b\arcsin(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate(-(c^3*d^2*f*x^3 + c^2*d^2*f*x^2 - c*d^2*f*x - d
^2*f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)), x) + 1/40*(15*sqrt(-c^2*d*f*x^2 + d*f)*d^2*f*x + 15*d^3*f^2*arcsin(c*x)
/(sqrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*d*x - 8*(-c^2*d*f*x^2 + d*f)
^(5/2)/(c*f))*a
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^3*d^2*f*x^3 + a*c^2*d^2*f*x^2 - a*c*d^2*f*x - a*d^2*f + (b*c
^3*d^2*f*x^3 + b*c^2*d^2*f*x^2 - b*c*d^2*f*x - b*d^2*f)*arcsin(c*x))*sqrt(c
*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{5/2}\,\left(f-c\,f\,x\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2), x)
```

3.511 $\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=226

$$-\frac{5bcx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}+\frac{bc^3x^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}+\frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx$$

```
[Out] -5/16*b*c*x^2*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/16*b*c^
3*x^4*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/4*x*(c*d*x+d)^(
3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))+3/8*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3
/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)+3/16*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a
+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(3/2)
```

Rubi [A]

time = 0.16, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 4743, 4741, 4737, 30, 14}

$$\frac{3x(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{8\left(1-c^2x^2\right)}+\frac{3(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))^2}{16bc\left(1-c^2x^2\right)^{3/2}}+\frac{1}{4}x(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))-\frac{5bcx^2(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}+\frac{bc^3x^4(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*b*c*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*x*(d +
c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)) + (3*
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(16*b*c*(1 - c^2
*x^2)^(3/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\int (d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx &= \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(ca\right.}{\left(1-c^2x^2\right)^{3/2}} \\
&= \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{(3(d+c}{} \\
&= \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{3x(d+c}{} \\
&= -\frac{5bcx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}+\frac{bc^3x^4(d+cdx)^{3/2}(f-}{16\left(1-c^2x^2\right)^{3/}}
\end{aligned}
$$

Mathematica [A]

time = 0.60, size = 247, normalized size = 1.09

$$\frac{24bdf\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-48ad^{3/2}f^{3/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+df\sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(16acx(5-2c^2x^2)\sqrt{1-c^2x^2}+16b\cos(2\text{ArcSin}(cx))+b\cos(4\text{ArcSin}(cx))\right)+4bdf\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)(8\sin(2\text{ArcSin}(cx))+\sin(4\text{ArcSin}(cx)))}{128c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*b*d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 48*a*d^(3/2)*f^(3
/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]
*Sqrt[f]*(-1 + c^2*x^2))] + d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*a*c*x*(
5 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin
[c*x]]) + 4*b*d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(8*Sin[2*ArcS
in[c*x]] + Sin[4*ArcSin[c*x]]))/(128*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{3}{2}} (-cfx+f)^{\frac{3}{2}} (a+b\arcsin(cx))\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate(-(c^2*d*f*x^2 - d*f)*sqrt(c*x + 1)*sqrt(-c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/8*(3*sqrt(-c^2*d*f*x^
2 + d*f)*d*f*x + 3*d^2*f^2*arcsin(c*x)/(sqrt(d*f)*c) + 2*(-c^2*d*f*x^2 + d*
f)^(3/2)*x)*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d*f*x^2 - a*d*f + (b*c^2*d*f*x^2 - b*d*f)*arcsin(c*x))*sqr
t(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3003 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{3/2}\,\left(f-c\,f\,x\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2), x)
```

3.512 $\int \sqrt{d+cdx}\,(f-cfx)^{3/2}(a+b\textbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=273

$$-\frac{bfx\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}+\frac{bc^2fx^3\sqrt{d+cdx}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d+cdx}$$

```
[Out] 1/2*f*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+1/3*f*(-c^2*x^2+
1)*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c-1/3*b*f*x*(c*d*x+d)
^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/4*b*c*f*x^2*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/9*b*c^2*f*x^3*(c*d*x+d)^(1/2)*(-c*f*x+f
)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.22, antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 4847, 4741, 4737, 30, 4767}

$$\frac{f\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{1-c^2x^2}}+\frac{f(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{3c}+\frac{1}{2}fx\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))-\frac{bcfx^2\sqrt{cdx+d}\,\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}-\frac{bfx\sqrt{cdx+d}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}+\frac{bc^2fx^3\sqrt{cdx+d}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/3*(b*f*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/Sqrt[1 - c^2*x^2] - (b*c*f*x^2
*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) + (b*c^2*f*x^3*Sqrt
[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (f*x*Sqrt[d + c*d*x]*S
qrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*
(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*
x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
```

```
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\int \sqrt{d+cdx}\,(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)\,dx &= \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int (f-cfx)\sqrt{1-c^2x^2}\,(a+b\sin
}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int \left(f\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx
}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(f\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))
}{\sqrt{1-c^2x^2}} \\
&= \frac{1}{2}fx\sqrt{d+cdx}\,\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)+\frac{f\sqrt{d+cd
}{} \\
&= -\frac{bfx\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d+cdx}\,\sqrt{f-cf
}{4\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A]
time = 0.59, size = 260, normalized size = 0.95

$$\frac{18bf\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-36a\sqrt{d}\,f^{3/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+f\sqrt{d+cdx}\,\sqrt{f-cfx}\left(12a(2+3cx-2c^2x^2)\sqrt{1-c^2x^2}+8bcx(-3+c^2x^2)+9b\cos(2\text{ArcSin}(cx))\right)+6bf\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)\left(4(1-c^2x^2)^{3/2}+3\sin(2\text{ArcSin}(cx))\right)}{72c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (18*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*Sqrt[d]*f^(3/2
)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*S
qrt[f]*(-1 + c^2*x^2))] + f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(12*a*(2 + 3*c*
x - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c*x*(-3 + c^2*x^2) + 9*b*Cos[2*ArcSi
n[c*x]]) + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(4*(1 - c^2*x^
2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}\left(a+b\arcsin(cx)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate(-(c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/6*(3*sqrt(-c^2*d*f*x^2 + d*f)
*f*x + 3*d*f^2*arcsin(c*x)/(sqrt(d*f)*c) + 2*(-c^2*d*f*x^2 + d*f)^(3/2)/(c*
d))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d\left(cx+1\right)}\left(-f\left(cx-1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(3/2)*(a + b*asin(c*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{d+c\,d\,x}\,{\left(f-c\,f\,x\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(3/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(3/2), x)
```

3.513 $\int \frac{(f-cfx)^{3/2}(a+b\mathbf{ArcSin}(cx))}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=242

$$-\frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{2f^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{f^2x(1-c^2x^2)\,(a+b\text{A}}{2\sqrt{d+cdx}\,\sqrt{f-}}$$

```
[Out] 2*f^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/2
*f^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-2*b*
f^2*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/4*b*c*f^2*x^2*(
-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*f^2*(a+b*arcsin(c*x)
)^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\frac{3f^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{f^2x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{2\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{2f^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\,\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-2*b*f^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*f^2
*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (2*f^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (f^2*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*
f^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}} - \frac{2cf^2x(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}} + \frac{c^2f^2x^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\right.}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\left(f^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{\left(2cf^2\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(c}{\sqrt{1-c^2x^2}}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{2f^2(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{f^2x(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\,\sqrt{f-cfx}} + $$

$$= -\frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{2f^2(1-c^2x^2)(}{c\sqrt{d+cdx}}$$

Mathematica [A]
time = 0.65, size = 238, normalized size = 0.98

$$\frac{-4bf(-4+cx)\sqrt{d+cdx}\,\sqrt{f-cfx}\,\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+6bf\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-12a\sqrt{d}\,f^{3/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)-f\sqrt{d+cdx}\,\sqrt{f-cfx}\left(16bcx+4a(-4+cx)\sqrt{1-c^2x^2}+b\cos(2\text{ArcSin}(cx))\right)}{8cd\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-4*b*f*(-4 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*ArcSin
[c*x] + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 12*a*Sqrt[d]*
f^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqr
t[d]*Sqrt[f]*(-1 + c^2*x^2))] - f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*b*c*x
 + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]))/(8*c*d*Sqrt[1
- c^2*x^2])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{(-cfx+f)^{\frac{3}{2}}\left(a+b\arcsin(cx)\right)}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] -1/2*(sqrt(-c^2*d*f*x^2 + d*f)*f*x/d - 3*f^2*arcsin(c*x)/(sqrt(d*f)*c) - 4*
sqrt(-c^2*d*f*x^2 + d*f)*f/(c*d))*a - b*sqrt(f)*integrate((c*f*x - f)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(c*x + 1), x)/sqrt
(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(-c*f*x + f)/sq
rt(c*d*x + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-f(cx-1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{\sqrt{d(cx+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
```

```
[Out] Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/sqrt(d*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{3/2}}{\sqrt{d+c\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(1/2), x)
```

3.514 $\int \frac{(f-cfx)^{3/2}(a+b\mathbf{ArcSin}(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=252

$$\frac{bf^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{4f^3(1-cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{f^3(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-3f$$

```
[Out] b*f^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-4*f^3*(-c*x+1)*
(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-f^3*(-c^2
*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-3/2*f^3*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+4*b
*f^3*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A]
time = 0.30, antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737, 4767, 8}

$$-\frac{3f^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{f^3(1-c^2x^2)^2(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{4f^3(1-cx)(1-c^2x^2)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{bf^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{4bf^3(1-c^2x^2)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (b*f^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (4*f^
3*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c*
f*x)^(3/2)) - (f^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (3*f^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2
*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*f^3*(1 - c^2*x^2)^(3/2)*Lo
g[1 + c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
```

```
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(f-cfx)^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{4\left(f^3-cf^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}} - \frac{3f^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{cf^3x(a+b\,\mathrm{s}}{\sqrt{1-}\cdots\right.}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(f^3-cf^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(3f^3\left(1-c^2x^2\right)^{3/2}\right)\int \cdots}{(d+cdx)^{3/2}(f-\cdots}$$

$$= -\frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3\left(1-c^2x^2\right)^2\left(a+b\sin\cdots\right.}{c(d+cdx)^{3/2}(f-c\cdots}$$

$$= \frac{bf^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\cdots$$

$$= \frac{bf^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\cdots$$

$$= \frac{bf^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\cdots$$

Mathematica [A]
time = 2.02, size = 291, normalized size = 1.15

$$\frac{f\left(6a\sqrt{d}\sqrt{f}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(-1+c^2x^2\right)}\right)-\frac{\sqrt{d+cdx}\sqrt{f-cfx}\csc^2\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\left(2b(5+cx)\left(-1+cx+\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)-3b\left(-1-cx+\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)^2+2\left(bcx\left(-1-cx+\sqrt{1-c^2x^2}\right)+a(5+cx)\left(-1+cx+\sqrt{1-c^2x^2}\right)+8b\left(-1-cx+\sqrt{1-c^2x^2}\right)\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)\right)\right)}{2\sqrt{1-c^2x^2}\left(1+\cot\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}\right)}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (f*(6*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] - (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Csc[ArcSin[c
*x]/2]^2*(2*b*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 3*b*(-
1 - c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*(b*c*x*(-1 - c*x + Sqrt[1 -
c^2*x^2]) + a*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2]) + 8*b*(-1 - c*x + Sq
rt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])))/(2*Sqrt[1
- c^2*x^2]*(1 + Cot[ArcSin[c*x]/2]))))/(2*c*d^2)
```

Maple [F]
time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{(-cfx+f)^{\frac{3}{2}} (a+b\arcsin(cx))}{(cdx+d)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] -b*sqrt(d)*sqrt(f)*integrate((c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x) +
 a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - 6*sqrt
(-c^2*d*f*x^2 + d*f)*f/(c^2*d^2*x + c*d^2) - 3*f^2*arcsin(c*x)/(c*d^2*sqrt(
f/d)))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-f(cx-1))^{\frac{3}{2}} (a+b\operatorname{asin}(cx))}{(d(cx+1))^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
```

```
[Out] Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/(d*(c*x + 1))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{3/2}}{\left(d+c\,d\,x\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(3/2), x)
```

3.515 $\int \frac{(f-cfx)^{3/2}(a+b\mathbf{ArcSin}(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=324

$$-\frac{4bf^4(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{bf^4(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{2f^4(1-cx)^3\,(1-c^2x^2)\,(a+b\text{ArcSin}($$

```
[Out] -4/3*b*f^4*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1/
2*b*f^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
-2/3*f^4*(-c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*
x+f)^(5/2)+2*f^4*(-c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2
)/(-c*f*x+f)^(5/2)+f^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(
c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*f^4*(-c^2*x^2+1)^(5/2)*ln(c*x+1)/c/(c
*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A]

time = 0.25, antiderivative size = 324, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4763, 683, 667, 222, 4845, 641, 45, 31, 4737}

$$\frac{2f^4(1-cx)\,(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^4(1-cx)^3\,(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{f^4(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^4(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{4bf^4(1-c^2x^2)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{8bf^4(1-c^2x^2)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (-4*b*f^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*f^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (2*f^4*(1 - c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (f^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*f^4*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
```

```
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)\left(1-c^2x^2\right)^2}{c(d+cdx)^{5/2}(f}$$

$$= -\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)\left(1-c^2x^2\right)^2}{c(d+cdx)^{5/2}(f}$$

$$= -\frac{bf^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(c\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(c\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{4bf^4\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bf^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} -$$

Mathematica [A]
time = 3.21, size = 599, normalized size = 1.85

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (f*((16*a*(1 + 2*c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x)^2 - 12*a*S
qrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f
]*(-1 + c^2*x^2))] - (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]
 - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[c*x] + 9*ArcSin[c
*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*
x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 3*(2 +
 Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((-1 + c*x)*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
```

```
*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[
c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]
*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(
-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((-1 + c*x)*(C
os[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4)))/(12*c*d^3)
```

Maple [F]
time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{(-cfx+f)^{\frac{3}{2}} (a+b\arcsin(cx))}{(cdx+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] -b*sqrt(d)*sqrt(f)*integrate((c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^
3*x + d^3), x) - 1/3*a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^4*d^4*x^3 + 3*c^3*d^4
*x^2 + 3*c^2*d^4*x + c*d^4) + 2*sqrt(-c^2*d*f*x^2 + d*f)*f/(c^3*d^3*x^2 + 2
*c^2*d^3*x + c*d^3) - 7*sqrt(-c^2*d*f*x^2 + d*f)*f/(c^2*d^3*x + c*d^3) - 3*
f^2*arcsin(c*x)/(c*d^3*sqrt(f/d)))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(f-c\,f\,x)}^{3/2}}{{(d+c\,d\,x)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(5/2), x)
```

3.516 $\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=315

$$-\frac{25bcx^2(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}}+\frac{5bc^3x^4(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}}+\frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c}$$

```
[Out] -25/96*b*c*x^2*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)/(-c^2*x^2+1)^(5/2)+5/96*b*c
^3*x^4*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)/(-c^2*x^2+1)^(5/2)+1/6*x*(c*d*x+d)^
(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))+5/16*x*(c*d*x+d)^(5/2)*(-c*f*x+f)^
(5/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^2+5/24*x*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5
/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)+5/32*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a
+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(5/2)+1/36*b*(c*d*x+d)^(5/2)*(-c*f*x+f)^
(5/2)*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.19, antiderivative size = 315, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {4763, 4743, 4741, 4737, 30, 14, 267}

$$\frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))}{24\left(1-c^2x^2\right)}+\frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))}{16\left(1-c^2x^2\right)^2}+\frac{5(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))^2}{32bc\left(1-c^2x^2\right)^{5/2}}+\frac{1}{6}x(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))-\frac{25bcx^2(cdx+d)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}}+\frac{b\sqrt{1-c^2x^2}\,(cdx+d)^{5/2}(f-cfx)^{5/2}}{36c}+\frac{5bc^3x^4(cdx+d)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-25*b*c*x^2*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2))
+ (5*b*c^3*x^4*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2)
) + (b*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*Sqrt[1 - c^2*x^2])/(36*c) + (x*(
d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*x*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^2) + (5*x*
(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(24*(1 - c^2*x^2))
 + (5*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(32*b*c*(1
 - c^2*x^2)^(5/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{\left((d+cdx)^{5/2}(f-cfx)^{5/2}\right)\int \left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(c\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right) + \frac{(5(d+}{}$$

$$= \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c} + \frac{1}{6}x(d+cdx)^{5/2}$$

$$= \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c} + \frac{1}{6}x(d+cdx)^{5/2}$$

$$= -\frac{25bcx^2(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}} + \frac{5bc^3x^4(d+cdx)^{5/2}(}{96\left(1-c^2x\right.}$$

Mathematica [A]
time = 0.98, size = 303, normalized size = 0.96

$$\frac{d^2f^2\left(360b\sqrt{d+cdx}\sqrt{f-cfx}\,\mathrm{ArcSin}(cx)^2-720a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}\left(-1+c^2x^2\right)}\right)+\sqrt{d+cdx}\sqrt{f-cfx}\left(1584acx\sqrt{1-c^2x^2}-1248ac^3x^3\sqrt{1-c^2x^2}+384ac^5x^5\sqrt{1-c^2x^2}+270b\cos(2\mathrm{ArcSin}(cx))+27b\cos(4\mathrm{ArcSin}(cx))+2b\cos(6\mathrm{ArcSin}(cx))\right)+12b\sqrt{d+cdx}\sqrt{f-cfx}\,\mathrm{ArcSin}(cx)(45\sin(2\mathrm{ArcSin}(cx))+9\sin(4\mathrm{ArcSin}(cx))+\sin(6\mathrm{ArcSin}(cx)))\right)}{2304c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*f^2*(360*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(1584*a*
c*x*Sqrt[1 - c^2*x^2] - 1248*a*c^3*x^3*Sqrt[1 - c^2*x^2] + 384*a*c^5*x^5*Sq
rt[1 - c^2*x^2] + 270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] + 2*b*
Cos[6*ArcSin[c*x]]) + 12*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(45*
Sin[2*ArcSin[c*x]] + 9*Sin[4*ArcSin[c*x]] + Sin[6*ArcSin[c*x]])))/(2304*c*S
qrt[1 - c^2*x^2])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{5}{2}}\left(-cfx+f\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c^4*d^2*f^2*x^4 - 2*c^2*d^2*f^2*x^2 + d^2*f^2)
*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x
) + 1/48*(15*sqrt(-c^2*d*f*x^2 + d*f)*d^2*f^2*x + 15*d^3*f^3*arcsin(c*x)/(s
qrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*d*f*x + 8*(-c^2*d*f*x^2 + d*f)^
(5/2)*x)*a
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^4*d^2*f^2*x^4 - 2*a*c^2*d^2*f^2*x^2 + a*d^2*f^2 + (b*c^4*d^2*
f^2*x^4 - 2*b*c^2*d^2*f^2*x^2 + b*d^2*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{asin}(c\,x))\,\left(d + c\,d\,x\right)^{5/2}\,\left(f - c\,f\,x\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2), x)
```

3.517 $\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=414

$$-\frac{bfx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}}-\frac{5bcfx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}+\frac{2bc^2fx^3(d+cdx)^{3/2}(f-cfx)^{3/2}}{15\left(1-c^2x^2\right)^{3/2}}+\frac{bc^3fx^4}{}$$

```
[Out] -1/5*b*f*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-5/16*b*c*f*x
^2*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+2/15*b*c^2*f*x^3*(c*
d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/16*b*c^3*f*x^4*(c*d*x+d)
^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-1/25*b*c^4*f*x^5*(c*d*x+d)^(3/2)
*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/4*f*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/
2)*(a+b*arcsin(c*x))+3/8*f*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c
*x))/(-c^2*x^2+1)+1/5*f*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(-c^2*x^2+1)*(a+b*
arcsin(c*x))/c+3/16*f*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))^2/
b/c/(-c^2*x^2+1)^(3/2)
```

Rubi [A]
time = 0.28, antiderivative size = 414, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4763, 4847, 4743, 4741, 4737, 30, 14, 4767, 200}

$$\frac{3fx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{8\left(1-c^2x^2\right)}+\frac{3f(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))^2}{16bc\left(1-c^2x^2\right)^{3/2}}+\frac{f\left(1-c^2x^2\right)(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))}{5c}+\frac{1}{4}fx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\text{ArcSin}(cx))-\frac{5bcfx^2(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}-\frac{bfx(cdx+d)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}}+\frac{2bc^2fx^3(cdx+d)^{3/2}(f-cfx)^{3/2}}{15\left(1-c^2x^2\right)^{3/2}}-\frac{bc^4fx^5(cdx+d)^{3/2}(f-cfx)^{3/2}}{25\left(1-c^2x^2\right)^{3/2}}+\frac{bc^3fx^4(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/5*(b*f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(1 - c^2*x^2)^(3/2) - (5*b
*c*f*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) + (2
*b*c^2*f*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2))
+ (b*c^3*f*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)
) - (b*c^4*f*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/
2)) + (f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*
f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^
2)) + (f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*
x]))/(5*c) + (3*f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2
)/(16*b*c*(1 - c^2*x^2)^(3/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int (f-cfx)\left(1-c^2x^2\right)^{3/2}(a+}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(f\left(1-c^2x^2\right)^{3/2}(a+b\sin^{-1}\right.}{\left(1-c^2x^2\right)^{3/}}$$

$$= \frac{\left(f(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\sin^{-1}(c}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{f(d+c}{}$$

$$= \frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}\left(a+b\sin^{-1}(cx)\right)+\frac{3fx(d+}{}$$

$$= -\frac{bfx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}}-\frac{5bcfx^2(d+cdx)^{3/2}(f-}{16\left(1-c^2x^2\right)^{3/2}}$$

Mathematica [A]
time = 0.89, size = 305, normalized size = 0.74

$$\frac{df^2\left(1800b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-3600a\sqrt{d}\,\sqrt{f}\,\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+\sqrt{d+cdx}\,\sqrt{f-cfx}\left(-128bcx(15-10c^2x^2+3c^4x^4)+240a\sqrt{1-c^2x^2}\,(8+25cx-16c^2x^2-10c^3x^3+8c^4x^4)+1200b\cos(2\text{ArcSin}(cx))+75b\cos(4\text{ArcSin}(cx))\right)+60b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)\left(32(1-c^2x^2)^{5/2}+40\sin(2\text{ArcSin}(cx))+5\sin(4\text{ArcSin}(cx))\right)\right)}{9600c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*f^2*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-128*b*
c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 240*a*Sqrt[1 - c^2*x^2]*(8 + 25*c*x - 1
```

```
6*c^2*x^2 - 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b*Cos[
4*ArcSin[c*x]]) + 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(32*(1 -
 c^2*x^2)^(5/2) + 40*Sin[2*ArcSin[c*x]] + 5*Sin[4*ArcSin[c*x]])))/(9600*c*S
qrt[1 - c^2*x^2])
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \left(c d x +d \right)^{\frac{3}{2}} \left(-c f x +f \right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c^3*d*f^2*x^3 - c^2*d*f^2*x^2 - c*d*f^2*x + d*
f^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
), x) + 1/40*(15*sqrt(-c^2*d*f*x^2 + d*f)*d*f^2*x + 15*d^2*f^3*arcsin(c*x)/
(sqrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*f*x + 8*(-c^2*d*f*x^2 + d*f)^
(5/2)/(c*d))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^3*d*f^2*x^3 - a*c^2*d*f^2*x^2 - a*c*d*f^2*x + a*d*f^2 + (b*c^
3*d*f^2*x^3 - b*c^2*d*f^2*x^2 - b*c*d*f^2*x + b*d*f^2)*arcsin(c*x))*sqrt(c*
d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{3/2}\,\left(f-c\,f\,x\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2), x)
```

3.518 $\int \sqrt{d+cdx}\,(f-cfx)^{5/2}(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=376

$$-\frac{2bf^2x\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{3bcf^2x^2\sqrt{d+cdx}\,\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}+\frac{2bc^2f^2x^3\sqrt{d+cdx}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}-\frac{bc^3f^2x^4\sqrt{}}{1}$$

```
[Out] 3/8*f^2*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+1/4*c^2*f^2*x^
3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+2/3*f^2*(-c^2*x^2+1)*(
a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c-2/3*b*f^2*x*(c*d*x+d)^(
1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*c*f^2*x^2*(c*d*x+d)^(1/2)*(
-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+2/9*b*c^2*f^2*x^3*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^3*f^2*x^4*(c*d*x+d)^(1/2)*(-c*f*x+f)
^(1/2)/(-c^2*x^2+1)^(1/2)+5/16*f^2*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*
f*x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.38, antiderivative size = 376, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 4847, 4741, 4737, 30, 4767, 4783, 4795}

$$\frac{1}{4}c^2f^2x^3\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))+\frac{5f^2\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))^2}{16bc\sqrt{1-c^2x^2}}+\frac{2f^2(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))}{3c}+\frac{3}{8}f^2x\sqrt{cdx+d}\,\sqrt{f-cfx}\,(a+b\text{ArcSin}(cx))-\frac{3bcf^2x^2\sqrt{cdx+d}\,\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}-\frac{2bf^2x\sqrt{cdx+d}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}+\frac{2bc^2f^2x^3\sqrt{cdx+d}\,\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}-\frac{bc^3f^2x^4\sqrt{cdx+d}\,\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*b*f^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c
*f^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (2*b*c^2
*f^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*f^
2*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*f^2*x*Sq
rt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*f^2*x^3*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 + (2*f^2*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*f^2*Sqrt[d + c*
d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \sqrt{d+cdx}\,(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int(f-cfx)^2\sqrt{1-c^2x^2}\,(a+b\,\mathrm{s}}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int\left(f^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(c\right.}{}$$

$$= \frac{\left(f^2\sqrt{d+cdx}\,\sqrt{f-cfx}\right)\int\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}f^2x\sqrt{d+cdx}\,\sqrt{f-cfx}\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}c^2f^2x^3\sqrt{}$$

$$= -\frac{2bf^2x\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcf^2x^2\sqrt{d+cdx}\,\sqrt{f-}}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{2bf^2x\sqrt{d+cdx}\,\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{3bcf^2x^2\sqrt{d+cdx}\,\sqrt{f}}{16\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.70, size = 293, normalized size = 0.78

$$\frac{360bf^2\sqrt{d+cdx}\,\sqrt{f-cfx}\,\mathrm{ArcSin}(cx)^2-720a\sqrt{d}\,f^{5/2}\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+f^2\sqrt{d+cdx}\,\sqrt{f-cfx}\left(256bcx(-3+c^2x^2)+48a\sqrt{1-c^2x^2}\,(16+9cx-16c^2x^2+6c^3x^3)+144b\cos(2\mathrm{ArcSin}(cx))-9b\cos(4\mathrm{ArcSin}(cx))\right)-12bf^2\sqrt{d+cdx}\,\sqrt{f-cfx}\,\mathrm{ArcSin}(cx)\left(-64(1-c^2x^2)^{3/2}-24\sin(2\mathrm{ArcSin}(cx))+3\sin(4\mathrm{ArcSin}(cx))\right)}{1152c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (360*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt[d]*f^
(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] + f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(256*b*c*
x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(16 + 9*c*x - 16*c^2*x^2 + 6*c^3*
x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) - 12*b*f^2*Sqrt[d
 + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) - 24*Sin[2*A
rcSin[c*x]] + 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \sqrt{cdx + d}\, (-cfx + f)^{\frac{5}{2}} (a + b \arcsin (cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/24*(15*sqr
t(-c^2*d*f*x^2 + d*f)*f^2*x + 15*d*f^3*arcsin(c*x)/(sqrt(d*f)*c) - 6*(-c^2*
d*f*x^2 + d*f)^(3/2)*f*x/d + 16*(-c^2*d*f*x^2 + d*f)^(3/2)*f/(c*d))*a
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6188 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{asin}(c\,x))\,\sqrt{d + c\,d\,x}\,\left(f - c\,f\,x\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(5/2), x)
```

3.519 $\int \frac{(f-cfx)^{5/2}(a+b\text{ArcSin}(cx))}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=345

$$-\frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{11f^3(1-c^2x^2)\,(a+b\text{ArcSin}(}{3c\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

```
[Out] 11/3*f^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-
3/2*f^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1
/3*c*f^3*x^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2
)-11/3*b*f^3*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*b*c*
f^3*x^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/9*b*c^2*f^3*x
^3*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+5/4*f^3*(a+b*arcsin(
c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A]
time = 0.41, antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\frac{5f^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{cf^3x^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{3f^3x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{2\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{11f^3(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3c\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{cdx+d}\,\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-11*b*f^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*
c*f^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (b*c^2*f
^3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (11*f^3*(1
- c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*
f^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
) + (c*f^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]) + (5*f^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)^3(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^3(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}} - \frac{3cf^3x(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}} + \frac{3c^2f^3x^2(a+b\sin^{-1}(cx}{\sqrt{1-c^2x^2}}\right.}{\sqrt{d+cdx}\,\sqrt{f-cfx}} \\
&= \frac{\left(f^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{\left(3cf^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(c}{\sqrt{1-c^2x^2}}}{\sqrt{d+cdx}\,\sqrt{f-cfx}} \\
&= \frac{3f^3(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{3f^3x(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\,\sqrt{f-cfx}} + \\
&= -\frac{3bf^3x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-}{9\sqrt{d+cdx}\,\sqrt{}} \\
&= -\frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1}{9\sqrt{d+cdx}\,\sqrt{}}
\end{aligned}
$$

Mathematica [A]
time = 1.04, size = 274, normalized size = 0.79

$$
\frac{90bf^2\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-180a\sqrt{d}\,f^{5/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)-6bf^2\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)\left(9(-5+2cx)\sqrt{1-c^2x^2}+\cos(3\text{ArcSin}(cx))\right)+f^2\sqrt{d+cdx}\,\sqrt{f-cfx}\left(-270bcx+12a\sqrt{1-c^2x^2}\,(22-9cx+2c^2x^2)-27b\cos(2\text{ArcSin}(cx))+2b\sin(3\text{ArcSin}(cx))\right)}{72cd\sqrt{1-c^2x^2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (90*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 180*a*Sqrt[d]*f^(
5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d
]*Sqrt[f]*(-1 + c^2*x^2))] - 6*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin
[c*x]*(9*(-5 + 2*c*x)*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + f^2*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*(-270*b*c*x + 12*a*Sqrt[1 - c^2*x^2]*(22 - 9*c*x +
 2*c^2*x^2) - 27*b*Cos[2*ArcSin[c*x]] + 2*b*Sin[3*ArcSin[c*x]]))/(72*c*d*Sq
rt[1 - c^2*x^2])
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$
\int \frac{(-cfx+f)^{\frac{5}{2}}\left(a+b\arcsin(cx)\right)}{\sqrt{cdx+d}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
maxima")
```

```
[Out] 1/6*(2*sqrt(-c^2*d*f*x^2 + d*f)*c*f^2*x^2/d - 9*sqrt(-c^2*d*f*x^2 + d*f)*f^
2*x/d + 15*f^3*arcsin(c*x)/(sqrt(d*f)*c) + 22*sqrt(-c^2*d*f*x^2 + d*f)*f^2/
(c*d))*a + b*sqrt(f)*integrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(c*x + 1), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(-c*f*x + f)/sqrt(c*d*x + d), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{\left(f-c\,f\,x\right)}^{5/2}}{\sqrt{d+c\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(1/2), x)
```

3.520 $\int \frac{(f-cfx)^{5/2}(a+b\mathbf{ArcSin}(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=465

$$\frac{3bf^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bcf^4x^2(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{15bf^4(1-c^2x^2)^{3/2}\,\mathrm{Arc}}{4c(d+cdx)^{3/2}(f-c}$$

```
[Out] 3/2*b*f^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+b*c*f^4*x^2
*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-5/4*b*f^4*(-c*x+1)^2*(
-c^2*x^2+1)^(3/2)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+15/4*b*f^4*(-c^2*x^2+1
)^(3/2)*arcsin(c*x)^2/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-2*f^4*(-c*x+1)^3*(
-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-15/2*f^4*(
-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-5/2*f^4*
(-c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2
)-15/2*f^4*(-c^2*x^2+1)^(3/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/
2)/(-c*f*x+f)^(3/2)+8*b*f^4*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/
(-c*f*x+f)^(3/2)
```

Rubi [A]
time = 0.27, antiderivative size = 465, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4763, 683, 685, 655, 222, 4845, 641, 45, 4737}

$$-\frac{5f^4(1-cx)\left(1-c^2x^2\right)^2(a+b\mathrm{ArcSin}(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{15f^4\left(1-c^2x^2\right)^2(a+b\mathrm{ArcSin}(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)(a+b\mathrm{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{15f^4\left(1-c^2x^2\right)^{3/2}\mathrm{ArcSin}(cx)(a+b\mathrm{ArcSin}(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{15bf^4\left(1-c^2x^2\right)^{3/2}\mathrm{ArcSin}(cx)^2}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{bcf^4x^2(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{3bf^4x(1-c^2x^2)^{3/2}}{2(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{8bf^4\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (3*b*f^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (
b*c*f^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5
*b*f^4*(1 - c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)^
(3/2)) + (15*b*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
)/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (15*f^4*(1 - c^2*x^2)^2*(a + b*
ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5*f^4*(1 - c*x)*
(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/
2)) - (15*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
+ c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*f^4*(1 - c^2*x^2)^(3/2)*Log[1 + c*
x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 685

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[2*c*
d*((m + p)/(c*(m + 2*p + 1))), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p, x], x]
/; FreeQ[{a, c, d, e, p}, x] && EqQ[c*d^2 + a*e^2, 0] && GtQ[m, 1] && NeQ[m
 + 2*p + 1, 0] && IntegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}}\,dx=\frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(f-cfx)^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$=-\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{15f^4\left(1-c^2x^2\right)^2(a+b}{2c(d+cdx)^{3/2}(f-}$$

$$=\frac{15bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{2f^4(1-}{c}$$

$$=\frac{15bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{15bf^4(1}{4c(d+}$$

$$=\frac{15bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{15bf^4(1}{4c(d+}$$

$$=\frac{3bf^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bcf^4x^2\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bf^4(1-c}{4c(d+cdx}$$

Mathematica [A]
time = 2.02, size = 685, normalized size = 1.47

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
[Out] (f^2*(8*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*(-24 - 7*c*x +
c^2*x^2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 120*a*Sqrt[d]*Sqrt[f]*
```

```
(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(S
qrt[d]*Sqrt[f]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) -
 8*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[
c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2]])*Sin[ArcSin[c*x]/2]) - 32*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x + 4*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + (-2 + Sq
rt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x]*(20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*(1
6*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 2*ArcSin[c*x]*(24*Cos[ArcSin
[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSin[c*x])/2] - 24*Sin[ArcSi
n[c*x]/2] + 7*Sin[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2]))))/(16*c*d^2
*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{(-cfx+f)^{\frac{5}{2}}\,(a+b\arcsin(cx))}{(cdx+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] -1/2*(c^2*f^3*x^3/(sqrt(-c^2*d*f*x^2 + d*f)*d) - 8*c*f^3*x^2/(sqrt(-c^2*d*f
*x^2 + d*f)*d) - 17*f^3*x/(sqrt(-c^2*d*f*x^2 + d*f)*d) + 15*f^3*arcsin(c*x)
/(sqrt(d*f)*c*d) + 24*f^3/(sqrt(-c^2*d*f*x^2 + d*f)*c*d))*a + b*sqrt(f)*int
egrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))/((c*d*x + d)*sqrt(c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^2*d^2*x^2 + 2*c
*d^2*x + d^2), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{5/2}}{\left(d+c\,d\,x\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(3/2), x)
```

3.521 $\int \frac{(f-cfx)^{5/2}(a+b\mathbf{ArcSin}(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=420

$$-\frac{bf^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{8bf^5(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{5bf^5(1-c^2x^2)^{5/2}\,\mathrm{ArcSin}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{2f^5(1-c}{3c}$$

```
[Out] -b*f^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*f^5*(-c^
2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-5/2*b*f^5*(-c^2*x
^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-2/3*f^5*(-c*x+
1)^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+10/3
*f^5*(-c*x+1)^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+
f)^(5/2)+5*f^5*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)+5*f^5*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^
(5/2)/(-c*f*x+f)^(5/2)-28/3*b*f^5*(-c^2*x^2+1)^(5/2)*ln(c*x+1)/c/(c*d*x+d)^
(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A]
time = 0.28, antiderivative size = 420, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 683, 655, 222, 4845, 641, 45, 4737}

$$\frac{5f^5(1-c^2x^2)^3(a+b\mathrm{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{10f^5(1-cx)^2(1-c^2x^2)^2(a+b\mathrm{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^5(1-cx)^4(1-c^2x^2)(a+b\mathrm{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{5f^5(1-c^2x^2)^{5/2}\mathrm{ArcSin}(cx)(a+b\mathrm{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{5bf^5(1-c^2x^2)^{5/2}\mathrm{ArcSin}(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^5x(1-c^2x^2)^{5/2}}{(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{8bf^5(1-c^2x^2)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{28bf^5(1-c^2x^2)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] -((b*f^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))) - (8
*b*f^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5
/2)) - (5*b*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(
f - c*f*x)^(5/2)) - (2*f^5*(1 - c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(
3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (10*f^5*(1 - c*x)^2*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (5*f^5
*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2
)) + (5*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*
d*x)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*f^5*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])
/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
```

```
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{(f-cfx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)^5\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^5(1-cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{10f^5(1-cx)^2\left(1-c^2x^2\right.}{3c(d+cdx)^{5/2}(\ldots}$$

$$= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-cx)^4\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-\ldots}{3\ldots}$$

$$= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-\ldots}{3\ldots}$$

$$= -\frac{bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bf^5\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \ldots$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 847 vs. 2(420) = 840.
time = 3.83, size = 847, normalized size = 2.02

Antiderivative was successfully verified.

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (f^2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(23 + 34*c*x + 3*c^2*x^2))/(1 +
c*x)^2 - 60*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/
(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[
c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
 Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^2])*Arc
Sin[c*x] + 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1 - c^2*x
^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((1
 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) + (2*b*Sqrt[d + c*d*x]
```

```
*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c
*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Co
s[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]]) + 2*(-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 -
c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2])
)/((1 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) + (b*Sqrt[d + c*d
*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(2*(4 + 6*c*x
 + 6*c^2*x^2 + 52*(1 + c*x)*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 18*ArcSin[c*x]^2*(Cos[ArcSin[c*x
]/2] + Sin[ArcSin[c*x]/2])^3 + ArcSin[c*x]*(-24*Cos[ArcSin[c*x]/2] - 35*Cos
[(3*ArcSin[c*x])/2] + 3*Cos[(5*ArcSin[c*x])/2] + 24*Sin[ArcSin[c*x]/2] - 35
*Sin[(3*ArcSin[c*x])/2] - 3*Sin[(5*ArcSin[c*x])/2])))/((-1 + c*x)*(Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2])^4)))/(12*c*d^3)
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{(-cfx+f)^{\frac{5}{2}} (a+b\arcsin(cx))}{(cdx+d)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/3*(3*(-c^2*d*f*x^2 + d*f)^(5/2)/(c^5*d^5*x^4 + 4*c^4*d^5*x^3 + 6*c^3*d^5*
x^2 + 4*c^2*d^5*x + c*d^5) - 5*(-c^2*d*f*x^2 + d*f)^(3/2)*f/(c^4*d^4*x^3 +
3*c^3*d^4*x^2 + 3*c^2*d^4*x + c*d^4) - 10*sqrt(-c^2*d*f*x^2 + d*f)*f^2/(c^3
*d^3*x^2 + 2*c^2*d^3*x + c*d^3) + 35*sqrt(-c^2*d*f*x^2 + d*f)*f^2/(c^2*d^3*
x + c*d^3) + 15*f^3*arcsin(c*x)/(c*d^3*sqrt(f/d)))*a + b*sqrt(f)*integrate(
(c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)), x)/sqrt(d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*d^3*x^3 + 3*c
^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(f-c\,f\,x)}^{5/2}}{{(d+c\,d\,x)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(5/2), x)
```

3.522 $\int \frac{(d+cdx)^{5/2}(a+b\mathbf{ArcSin}(cx))}{\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=345

$$\frac{11bd^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{11d^3(1-c^2x^2)\,(a+b\text{ArcSin}(c}{3c\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

```
[Out] -11/3*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
-3/2*d^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-
1/3*c*d^3*x^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/
2)+11/3*b*d^3*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*b*c
*d^3*x^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/9*b*c^2*d^3*
x^3*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+5/4*d^3*(a+b*arcsin
(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A]
time = 0.40, antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\frac{5d^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{cd^3x^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{3d^3x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{2\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{11d^3(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3c\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{11bd^3x\sqrt{1-c^2x^2}}{3\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{cdx+d}\,\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (11*b*d^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*c
*d^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c^2*d^
3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (11*d^3*(1 -
 c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*d
^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
 - (c*d^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x]) + (5*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\,(a+b\sin^{-1}(cx))}{\sqrt{f-cfx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^3(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d^3(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}} + \frac{3cd^3x(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}} + \frac{3c^2d^3x^2(a+b\sin^{-1}(c\cdots}{\sqrt{1-c^2x^2}}\right.\cdots}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\left(d^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(\cdots}{\sqrt{1-c^2x\cdots}}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= -\frac{3d^3(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{3d^3x(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{2\sqrt{d+cdx}\,\sqrt{f-cfx}}\cdots$$

$$= \frac{3bd^3x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{bc^2d^3x^3\sqrt{1-\cdots}}{9\sqrt{d+cdx}\,\sqrt{f\cdots}}$$

$$= \frac{11bd^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{bc^2d^3x^3\sqrt{1-\cdots}}{9\sqrt{d+cdx}\,\sqrt{\cdots}}$$

Mathematica [A]
time = 1.27, size = 270, normalized size = 0.78

$$-\frac{d^2\left(-90b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2+180a\sqrt{d}\,\sqrt{f}\,\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+6b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)\left(9(5+2cx)\sqrt{1-c^2x^2}-\cos(3\text{ArcSin}(cx))\right)+\sqrt{d+cdx}\,\sqrt{f-cfx}\left(-270bcx+12a\sqrt{1-c^2x^2}\,(22+9cx+2c^2x^2)+27b\cos(2\text{ArcSin}(cx))+2b\sin(3\text{ArcSin}(cx))\right)\right)}{72cf\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] -1/72*(d^2*(-90*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 + 180*a*Sqr
t[d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Ar
cSin[c*x]*(9*(5 + 2*c*x)*Sqrt[1 - c^2*x^2] - Cos[3*ArcSin[c*x]]) + Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x]*(-270*b*c*x + 12*a*Sqrt[1 - c^2*x^2]*(22 + 9*c*x +
2*c^2*x^2) + 27*b*Cos[2*ArcSin[c*x]] + 2*b*Sin[3*ArcSin[c*x]])))/(c*f*Sqrt[
1 - c^2*x^2])
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{5}{2}}\,(a+b\arcsin(cx))}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] -1/6*(2*sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*x^2/f + 9*sqrt(-c^2*d*f*x^2 + d*f)*d
^2*x/f - 15*d^3*arcsin(c*x)/(sqrt(d*f)*c) + 22*sqrt(-c^2*d*f*x^2 + d*f)*d^2
/(c*f))*a + b*sqrt(d)*integrate((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(-c*x + 1), x)/sqrt(f)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2
*x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c*f*x - f), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))\,\left(d + c\,d\,x\right)^{5/2}}{\sqrt{f - c\,f\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(1/2), x)
```

3.523 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))}{\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=242

$$\frac{2bd^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{2d^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{d^2x(1-c^2x^2)\,(a+b\text{Arc}}{2\sqrt{d+cdx}\,\sqrt{f-c}}$$

```
[Out] -2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/
2*d^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+2*b
*d^2*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/4*b*c*d^2*x^2*
(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*d^2*(a+b*arcsin(c*x
))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A]
time = 0.31, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\frac{3d^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{4bc\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{d^2x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{2\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{2d^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{2bd^2x\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\,\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (2*b*d^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*d^2*
x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (2*d^2*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*d
^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f -
 c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{f-cfx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{2cd^2x\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{c^2d^2x^2\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}}\right.}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\left(d^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{\left(2cd^2\sqrt{1-c^2x^2}\right)\int \frac{x\left(a+b\sin^{-1}(cx\right.}{\sqrt{1-c^2x^2}}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= -\frac{2d^2(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)}{c\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{d^2x(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\,\sqrt{f-cfx}} +$$

$$= \frac{2bd^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{bcd^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{2d^2(1-c^2x^2)\left(a\right.}{c\sqrt{d+cdx}\,\sqrt{}}$$

Mathematica [A]
time = 0.63, size = 238, normalized size = 0.98

$$\frac{-4bd(4+cx)\sqrt{d+cdx}\,\sqrt{f-cfx}\,\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+6bd\sqrt{d+cdx}\,\sqrt{f-cfx}\,\text{ArcSin}(cx)^2-12ad^{3/2}\sqrt{f}\,\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)+d\sqrt{d+cdx}\,\sqrt{f-cfx}\left(16bcx-4a(4+cx)\sqrt{1-c^2x^2}-b\cos(2\text{ArcSin}(cx))\right)}{8cf\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (-4*b*d*(4 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + 6*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 12*a*d^(3/2)*S
qrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt
[d]*Sqrt[f]*(-1 + c^2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*b*c*x
- 4*a*(4 + c*x)*Sqrt[1 - c^2*x^2] - b*Cos[2*ArcSin[c*x]]))/(8*c*f*Sqrt[1 -
c^2*x^2])
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] -1/2*(sqrt(-c^2*d*f*x^2 + d*f)*d*x/f - 3*d^2*arcsin(c*x)/(sqrt(d*f)*c) + 4*
sqrt(-c^2*d*f*x^2 + d*f)*d/(c*f))*a - b*sqrt(d)*integrate((c*d*x + d)*sqrt(
c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c*x - 1
), x)/sqrt(f)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c*f*x - f), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(d(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}(cx))}{\sqrt{-f\,(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))/sqrt(-f*(c*x - 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{3/2}}{\sqrt{f-c\,f\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(1/2), x)
```

3.524 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))}{\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=141

$$\frac{bdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}}-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}}+\frac{d\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

```
[Out] -d*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+b*d*x*
(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/2*d*(a+b*arcsin(c*x))
^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A]

time = 0.18, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4763, 4847, 4737, 4767, 8}

$$\frac{d\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc\sqrt{cdx+d}\,\sqrt{f-cfx}}-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c\sqrt{cdx+d}\,\sqrt{f-cfx}}+\frac{bdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\,\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d*(1 - c^2*x
^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (d*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\,(a+b\sin^{-1}(cx))}{\sqrt{f-cfx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}+\frac{cdx(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= \frac{\left(d\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{\left(cd\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

$$= -\frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{d\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{2bc\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{(bd\cdots}{\sqrt{d\cdots}}$$

$$= \frac{bdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{c\sqrt{d+cdx}\,\sqrt{f-cfx}} + \frac{d\sqrt{1-c^2x^2}\,(\cdots}{2bc\sqrt{d+cd\cdots}}$$

Mathematica [A]
time = 0.37, size = 200, normalized size = 1.42

$$\frac{\frac{2\sqrt{d+cdx}\,\sqrt{f-cfx}\left(bcx-a\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} - 2b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\mathrm{ArcSin}(cx) + \frac{b\sqrt{d+cdx}\,\sqrt{f-cfx}\,\mathrm{ArcSin}(cx)^2}{\sqrt{1-c^2x^2}} - 2a\sqrt{d}\,\sqrt{f}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)}{2cf}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] ((2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(b*c*x - a*Sqrt[1 - c^2*x^2]))/Sqrt[1 -
 c^2*x^2] - 2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x] + (b*Sqrt[d + c
*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 2*a*Sqrt[d]*Sqrt[f
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x
^2))])/(2*c*f)
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{cdx+d}\,\left(a+b\arcsin\left(cx\right)\right)}{\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] a*(d*arcsin(c*x)/(c*f*sqrt(d/f)) - sqrt(-c^2*d*f*x^2 + d*f)/(c*f)) + b*sqrt
(d)*integrate(sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt
(-c*x + 1), x)/sqrt(f)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*f*x - f),
 x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\left(cx+1\right)}\,\left(a+b\operatorname{asin}\left(cx\right)\right)}{\sqrt{-f\left(cx-1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/sqrt(-f*(c*x - 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}}{\sqrt{f-c\,f\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(1/2), x)
```

3.525 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=55

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(
1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {4763, 4737}

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{2bc\sqrt{cdx+d}\,\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c
*f*x])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}\,\sqrt{f-cfx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{f-cfx}} = \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{2bc\sqrt{d+cdx}\,\sqrt{f-cfx}}$$

Mathematica [A]
time = 0.28, size = 110, normalized size = 2.00

$$\frac{\frac{b\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2}{\sqrt{d+cdx}\,\sqrt{f-cfx}} - \frac{2a\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\,(-1+c^2x^2)}\right)}{\sqrt{d}\,\sqrt{f}}}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

```
[Out] ((b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (2
*a*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*
x^2))])/(Sqrt[d]*Sqrt[f]))/(2*c)
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}\,\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x)
```

Maxima [A]
time = 0.49, size = 32, normalized size = 0.58

$$\frac{b\arcsin(cx)^2}{2\sqrt{df}\,c} + \frac{a\arcsin(cx)}{\sqrt{df}\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] 1/2*b*arcsin(c*x)^2/(sqrt(d*f)*c) + a*arcsin(c*x)/(sqrt(d*f)*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d*f*x^2
 - d*f), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{\sqrt{d(cx+1)}\sqrt{-f(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*sqrt(-c*f*x + f)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a + b \operatorname{asin}(c\,x)}{\sqrt{d + c\,d\,x}\,\sqrt{f - c\,f\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(1/2)), x)
```

3.526 $\int \frac{a+b\mathbf{ArcSin}(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=99

$$-\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bf\left(1-c^2x^2\right)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] -f*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/
2)+b*f*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A]
time = 0.15, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 651, 4845, 12, 641, 31}

$$\frac{bf\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] -((f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2))) + (b*f*(1 - c^2*x^2)^(3/2)*Log[1 + c*x])/(c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx &= \frac{(1-c^2x^2)^{3/2}\int \frac{(f-cfx)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(bc(1-c^2x^2)^{3/2}\right)\int \frac{f(1-cx)}{c(1-c^2x^2)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(bf(1-c^2x^2)^{3/2}\right)\int \frac{1-cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(bf(1-c^2x^2)^{3/2}\right)\int \frac{1}{1+cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bf(1-c^2x^2)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

Mathematica [A]
time = 0.18, size = 79, normalized size = 0.80

$$\frac{\sqrt{d+cdx}\left(a(-1+cx)+b(-1+cx)\mathrm{ArcSin}(cx)+b\sqrt{1-c^2x^2}\log(-f(1+cx))\right)}{cd^2(1+cx)\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
```

[Out] (Sqrt[d + c*d*x]*(a*(-1 + c*x) + b*(-1 + c*x)*ArcSin[c*x] + b*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))]))/(c*d^2*(1 + c*x)*Sqrt[f - c*f*x])

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin\left(cx\right)}{\left(cdx+d\right)^{\frac{3}{2}}\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x)

[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x)

Maxima [A]
time = 0.49, size = 96, normalized size = 0.97

$$-\frac{\sqrt{-c^2dfx^2+df}\,b\arcsin\left(cx\right)}{c^2d^2fx+cd^2f}-\frac{\sqrt{-c^2dfx^2+df}\,a}{c^2d^2fx+cd^2f}+\frac{b\log\left(cx+1\right)}{cd^{\frac{3}{2}}\sqrt{f}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="maxima")

[Out] -sqrt(-c^2*d*f*x^2 + d*f)*b*arcsin(c*x)/(c^2*d^2*f*x + c*d^2*f) - sqrt(-c^2*d*f*x^2 + d*f)*a/(c^2*d^2*f*x + c*d^2*f) + b*log(c*x + 1)/(c*d^(3/2)*sqrt(f))

Fricas [A]
time = 2.62, size = 348, normalized size = 3.52

$$\left[\frac{\left(bcx+b\right)\sqrt{df}\log\left(\frac{c^6dfx^6+4c^5dfx^5+5c^4dfx^4-4c^2dfx^2-4cdfx-\left(c^4x^4+4c^3x^3+6c^2x^2+4cx\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{df}-2df}{c^4x^4+2c^3x^3-2cx-1}\right)-2\sqrt{cdx+d}\sqrt{-cfx+f}\left(b\arcsin\left(cx\right)+a\right)}{2\left(c^2d^2fx+cd^2f\right)},\ \frac{\left(bcx+b\right)\sqrt{-df}\arctan\left(\frac{\left(c^2x^2+2cx+2\right)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{-df}}{c^4dfx^4+2c^3dfx^3-c^2dfx^2-2cdfx}\right)-\sqrt{cdx+d}\sqrt{-cfx+f}\left(b\arcsin\left(cx\right)+a\right)}{c^2d^2fx+cd^2f}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="fricas")

[Out] [1/2*((b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c^5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*x^3 + 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d^2*f*x + c*d^2*f), ((b*c*x + b)*sqrt(-d*f)*arctan((c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(-d*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)) - sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d^2*f*x + c*d^2*f)]

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{\left(d \left(cx + 1\right)\right)^{\frac{3}{2}} \sqrt{- f \left(cx - 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/((d*(c*x + 1))**(3/2)*sqrt(-f*(c*x - 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{{\left(d+c\,d\,x\right)}^{3/2}\,\sqrt{f-c\,f\,x}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(1/2)), x)
```

3.527 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx$

Optimal. Leaf size=265

$$-\frac{bf^2(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{f^2x(1-c^2x^2)^2\left(a+b\text{ArcS}\right.}{3(d+cdx)^{5/2}(f-cfx}$$

```
[Out] -1/3*b*f^2*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-2/
3*f^2*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^
(5/2)+1/3*f^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)+1/3*b*f^2*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+
f)^(5/2)+1/6*b*f^2*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*
f*x+f)^(5/2)
```

Rubi [A]
time = 0.21, antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 667, 197, 4845, 641, 46, 213, 266}

$$\frac{f^2x(1-c^2x^2)^2(a+b\text{ArcSin}(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^2(1-c^2x^2)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf^2(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf^2(1-c^2x^2)^{5/2}\tanh^{-1}(cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] -1/3*(b*f^2*(1 - c^2*x^2)^(5/2))/(c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) + (f^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5/2)*ArcTan
h[c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5
/2)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(f-cfx)^2(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf^2\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf^2\left(1-c^2x^2\right)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^2(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A]
time = 0.22, size = 118, normalized size = 0.45

$$\frac{\sqrt{d+cdx}\left((2+cx)\left(-a+acx-b\sqrt{1-c^2x^2}\right)+b(-2+cx+c^2x^2)\,\mathrm{ArcSin}(cx)+b(1+cx)\sqrt{1-c^2x^2}\,\log(-f(1+cx))\right)}{3cd^3(1+cx)^2\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] (Sqrt[d + c*d*x]*((2 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b*(-2 + c*
x + c^2*x^2)*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))
]))/(3*c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x)
```

Maxima [A]
time = 0.50, size = 223, normalized size = 0.84

$$-\frac{1}{3}\,bc\left(\frac{1}{c^3d^{\frac{5}{2}}\sqrt{f}\,x+c^2d^{\frac{5}{2}}\sqrt{f}}-\frac{\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}\sqrt{f}}\right)-\frac{1}{3}\,b\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3d^3fx^2+2\,c^2d^3fx+cd^3f}+\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3fx+cd^3f}\right)\arcsin\left(cx\right)-\frac{1}{3}\,a\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3d^3fx^2+2\,c^2d^3fx+cd^3f}+\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3fx+cd^3f}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] -1/3*b*c*(1/(c^3*d^(5/2)*sqrt(f)*x + c^2*d^(5/2)*sqrt(f)) - log(c*x + 1)/(c
^2*d^(5/2)*sqrt(f))) - 1/3*b*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*f*x^2 + 2*c
^2*d^3*f*x + c*d^3*f) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*f*x + c*d^3*f))*a
rcsin(c*x) - 1/3*a*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*f*x^2 + 2*c^2*d^3*f*x
 + c*d^3*f) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*f*x + c*d^3*f))
```

Fricas [A]
time = 2.44, size = 525, normalized size = 1.98

$$\left[\frac{\left(bc^3x^3+bc^2x^2-bcx-b\right)\sqrt{df}\,\log\left(\frac{c^6dfx^6+4\,c^5dfx^5+5\,c^4dfx^4-4\,c^2dfx^2-4\,cdfx-\left(c^4x^4+4\,c^3x^3+6\,c^2x^2+4\,cx\right)\sqrt{-c^2x^2+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{df}-2\,df}{c^4x^4+2\,c^3x^3-2\,cx-1}\right)-2\left(ac^2x^2+\sqrt{-c^2x^2+1}\,bcx+acx+\left(bc^2x^2+bcx-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{6\left(c^4d^3fx^3+c^3d^3fx^2-c^2d^3fx-cd^3f\right)},\ \frac{\left(bc^3x^3+bc^2x^2-bcx-b\right)\sqrt{-df}\,\arctan\left(\frac{\left(c^2x^2+2\,cx+2\right)\sqrt{-c^2x^2+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{-df}}{c^4dfx^4+2\,c^3dfx^3-c^2dfx^2-2\,cdfx}\right)-\left(ac^2x^2+\sqrt{-c^2x^2+1}\,bcx+acx+\left(bc^2x^2+bcx-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{3\left(c^4d^3fx^3+c^3d^3fx^2-c^2d^3fx-cd^3f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c^
5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*x^
3 + 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(d*f) - 2*d*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*(a*c^2*x^2 + sqrt
(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2*b)*arcsin(c*x) - 2*a)
*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 + c^3*d^3*f*x^2 - c^2*d^3
*f*x - c*d^3*f), 1/3*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(-d*f)*arctan
((c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(-d*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)) - (a*c^
2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2*b)*arcsin
(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 + c^3*d^3*f*x
^2 - c^2*d^3*f*x - c*d^3*f)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{asin}\left(cx\right)}{\left(d\left(cx+1\right)\right)^{\frac{5}{2}}\sqrt{-f\left(cx-1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/((d*(c*x + 1))**(5/2)*sqrt(-f*(c*x - 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(d+c\,d\,x\right)}^{5/2}\,\sqrt{f-c\,f\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(1/2)), x)
```

3.528 $\int \frac{(d+cdx)^{5/2}(a+b\mathbf{ArcSin}(cx))}{(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=463

$$-\frac{3bd^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bcd^4x^2(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{15bd^4(1-c^2x^2)^{3/2}\,\mathrm{A}}{4c(d+cdx)^{3/2}(f-}$$

```
[Out] -3/2*b*d^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+b*c*d^4*x^
2*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-5/4*b*d^4*(c*x+1)^2*(
-c^2*x^2+1)^(3/2)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+15/4*b*d^4*(-c^2*x^2+1
)^(3/2)*arcsin(c*x)^2/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+2*d^4*(c*x+1)^3*(-
c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+15/2*d^4*(-
c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+5/2*d^4*(
c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-
15/2*d^4*(-c^2*x^2+1)^(3/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)
/(-c*f*x+f)^(3/2)+8*b*d^4*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(
-c*f*x+f)^(3/2)
```

Rubi [A]
time = 0.26, antiderivative size = 463, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4763, 683, 685, 655, 222, 4845, 641, 45, 4737}

$$\frac{5d^4(cx+1)\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{15d^4\left(1-c^2x^2\right)^2(a+b\text{ArcSin}(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2d^4(cx+1)^3\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{15d^4\left(1-c^2x^2\right)^{3/2}\text{ArcSin}(cx)(a+b\text{ArcSin}(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{15bd^4\left(1-c^2x^2\right)^{3/2}\text{ArcSin}(cx)^2}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{bcd^4x^2\left(1-c^2x^2\right)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{5bd^4(cx+1)^2\left(1-c^2x^2\right)^{3/2}}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{3bd^4x\left(1-c^2x^2\right)^{3/2}}{2(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{8bd^4\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (-3*b*d^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) +
(b*c*d^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (
5*b*d^4*(1 + c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)
^(3/2)) + (15*b*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
))/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (15*d^4*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (5*d^4*(1 + c*x)
*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3
/2)) - (15*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
 + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*d^4*(1 - c^2*x^2)^(3/2)*Log[1 - c
*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 685

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[2*c*
d*((m + p)/(c*(m + 2*p + 1))), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p, x], x]
/; FreeQ[{a, c, d, e, p}, x] && EqQ[c*d^2 + a*e^2, 0] && GtQ[m, 1] && NeQ[m
 + 2*p + 1, 0] && IntegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15d^4\left(1-c^2x^2\right)^2\left(a+b\sin\right.}{2c(d+cdx)^{3/2}(f-cf}$$

$$= -\frac{15bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2d^4(1-}{}$$

$$= -\frac{15bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15bd^4(}{4c(d-}$$

$$= -\frac{15bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15bd^4(}{4c(d-}$$

$$= -\frac{3bd^4x\left(1-c^2x^2\right)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bcd^4x^2\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+}{4c(d+cd}$$

Mathematica [**A**]
time = 2.52, size = 768, normalized size = 1.66

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (d^2*((8*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-24 + 7*c*x + c^2*x^2))/(-1 + c
*x) + 120*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(S
```

```
qrt[d]*Sqrt[f]*(-1 + c^2*x^2))] - (8*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c
*f*x]*(Cos[ArcSin[c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2
*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])^2) - (32*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(ArcSin
[c*x]^2*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + (c*x - 4*Log[Cos[ArcSin
[c*x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) -
 ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] - (-2 + Sqrt[1 - c
^2*x^2])*Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin
[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b*(1 + c*x
)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2]) + 2*(-16*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + 2
*ArcSin[c*x]*(24*Cos[ArcSin[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*Arc
Sin[c*x])/2] + 24*Sin[ArcSin[c*x]/2] - 7*Sin[(3*ArcSin[c*x])/2] + Sin[(5*Ar
cSin[c*x])/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)))/(16*c*f^2)
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{5}{2}} (a+b \arcsin (cx))}{(-cfx+f)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -1/2*(c^2*d^3*x^3/(sqrt(-c^2*d*f*x^2 + d*f)*f) + 8*c*d^3*x^2/(sqrt(-c^2*d*f
*x^2 + d*f)*f) - 17*d^3*x/(sqrt(-c^2*d*f*x^2 + d*f)*f) + 15*d^3*arcsin(c*x)
/(sqrt(d*f)*c*f) - 24*d^3/(sqrt(-c^2*d*f*x^2 + d*f)*c*f))*a - b*sqrt(d)*int
egrate((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/((c*f*x - f)*sqrt(-c*x + 1)), x)/sqrt(f)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2*
x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^2*f^2*x^2 - 2*c
*f^2*x + f^2), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{5/2}}{\left(f-c\,f\,x\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(3/2), x)
```

3.529 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))}{(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=252

$$-\frac{bd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{4d^3(1+cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{d^3(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-3d$$

```
[Out] -b*d^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+4*d^3*(c*x+1)*
(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+d^3*(-c^2
*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-3/2*d^3*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+4*b
*d^3*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A]
time = 0.30, antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737, 4767, 8}

$$-\frac{3d^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{d^3(1-c^2x^2)^2(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{4d^3(cx+1)(1-c^2x^2)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{bd^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{4bd^3(1-c^2x^2)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] -((b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))) + (4
*d^3*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(
3/2)*(f - c*f*x)^(3/2)) - (3*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(2*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*d^3*(1 - c^2*x^2)^(3/2)
*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
```

```
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{4\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}} - \frac{3d^3\left(a+b\sin^{-1}(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{cd^3x\left(a+b\sin^{-1}\right.}{\sqrt{1-c^2}}\right.}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(3d^3\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a}{\sqrt{}}}{(d+cdx)^{3/2}(f-}$$

$$= \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(\right.}{c(d+cdx)^{3/2}(f-cfx)^{3/}}$$

$$= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 514 vs. 2(252) = 504.
time = 1.72, size = 514, normalized size = 2.04

$$\frac{d\left(\frac{2a(-5+cx)\sqrt{d+cdx}\,\sqrt{f-cfx}}{-1+cx}+6a\sqrt{d}\,\sqrt{f}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{f-cfx}}{\sqrt{d}\,\sqrt{f}\left(-1+c^2x^2\right)}\right)-\frac{b(1+cx)\sqrt{d+cdx}\,\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\left((-4+\text{ArcSin}(cx))\text{ArcSin}(cx)-8\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)-\left(\text{ArcSin}(cx)(4+\text{ArcSin}(cx))-8\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)^2}-\frac{2b(1+cx)\sqrt{d+cdx}\,\sqrt{f-cfx}\left(\text{ArcSin}(cx)^2\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)+\left(cx-4\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-\text{ArcSin}(cx)\left(\left(2+\sqrt{1-c^2x^2}\right)\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\left(-2+\sqrt{1-c^2x^2}\right)\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)^2}\right)}{2cf^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (d*((2*a*(-5 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x) + 6*a*Sqrt[
d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-
1 + c^2*x^2))] - (b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c
*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] -
 Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c
```

```
*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) -
 (2*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(ArcSin[c*x]^2*(Cos[ArcSin[
c*x]/2] - Sin[ArcSin[c*x]/2]) + (c*x - 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin[c*x]*((2 + S
qrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] - (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[
c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)))/(2*c*f^2)
```

Maple [**F**]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{3}{2}}\,(a+b\arcsin(cx))}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c*d*x + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*f^2*x^2 - 2*c*f^2*x + f^2), x) -
a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) + 6*sqrt(
-c^2*d*f*x^2 + d*f)*d/(c^2*f^2*x - c*f^2) + 3*d^2*arcsin(c*x)/(c*f^2*sqrt(d
/f)))
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt
(-c*f*x + f)/(c^2*f^2*x^2 - 2*c*f^2*x + f^2), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(d(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))}{(-f\,(cx-1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))/(-f*(c*x - 1))**(3/2), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(d+c\,d\,x)}^{3/2}}{{(f-c\,f\,x)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(3/2), x)
```

3.530 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))}{(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=162

$$\frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{d^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{2bd^2(1-c^2x^2)^{3/2}\log(1-c}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] 2*d^2*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(
3/2)-1/2*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(-c
*f*x+f)^(3/2)+2*b*d^2*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f
*x+f)^(3/2)
```

Rubi [A]

time = 0.25, antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737}

$$-\frac{d^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2d^2(cx+1)\,(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2bd^2(1-c^2x^2)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f
 - c*f*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(
d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*d^2*(1 - c^2*x^2)^(3/2)*Log[1 -
c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\,(a+b\sin^{-1}(cx))}{(f-cfx)^{3/2}}\,dx = \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^2(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{2(d^2+cd^2x)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}} - \frac{d^2(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{\left(2(1-c^2x^2)^{3/2}\right)\int \frac{(d^2+cd^2x)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(d^2(1-c^2x^2)^{3/2}\right)\int \frac{a+b}{\sqrt{1}}}{(d+cdx)^{3/2}(f-c}$$

$$= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}}{2bc(d+cdx)^{3/2}(f-cfx)}$$

$$= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}}{2bc(d+cdx)^{3/2}(f-cfx)}$$

$$= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}}{2bc(d+cdx)^{3/2}(f-cfx)}$$

$$= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}}{2bc(d+cdx)^{3/2}(f-cfx)}$$

Mathematica [A]
time = 0.89, size = 281, normalized size = 1.73

$$-\frac{\frac{4a\sqrt{d+cdx}\sqrt{f-cfx}}{-1+cx} - 2a\sqrt{d}\sqrt{f}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) + \frac{b(1+cx)\sqrt{d+cdx}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\left((-4+\text{ArcSin}(cx))\text{ArcSin}(cx)-8\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)-\left(\text{ArcSin}(cx)(4+\text{ArcSin}(cx))-8\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)^2}}{2cf^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] -1/2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x) - 2*a*Sqrt[d]*Sqrt[f
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x
^2))] + (b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*((
-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2))/(c*f^2)
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^2*f^2*x - c*f^2) + d*arcsin(c*x)/(c*f^2*s
qrt(d/f))) - b*sqrt(d)*integrate(sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/((c*f*x - f)*sqrt(-c*x + 1)), x)/sqrt(f)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*f^2*x^2
- 2*c*f^2*x + f^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))}{(-f\,(cx-1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/(-f*(c*x - 1))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}}{(f-c\,f\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(3/2), x)
```

3.531 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+cdx}\,(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=98

$$\frac{d(1+cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bd\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] d*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
+b*d*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A]

time = 0.15, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4763, 651, 4845, 12, 641, 31}

$$\frac{d(cx+1)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{bd\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
```

```
[Out] (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c
*f*x)^(3/2)) + (b*d*(1 - c^2*x^2)^(3/2)*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*
(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}\,(f-cfx)^{3/2}}\,dx &= \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bc(1-c^2x^2)^{3/2}\right)\int \frac{d(1+cx)}{c(1-c^2x^2)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bd(1-c^2x^2)^{3/2}\right)\int \frac{1+cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bd(1-c^2x^2)^{3/2}\right)\int \frac{1}{1-cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&= \frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bd(1-c^2x^2)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

Mathematica [A]
time = 0.22, size = 106, normalized size = 1.08

$$\frac{\sqrt{d+cdx}\,\sqrt{f-cfx}\,\left(-a\sqrt{1-c^2x^2}-b\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+b(-1+cx)\log(f-cfx)\right)}{cdf^2(-1+cx)\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-(a*Sqrt[1 - c^2*x^2]) - b*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + b*(-1 + c*x)*Log[f - c*f*x]))/(c*d*f^2*(-1 + c*x)*Sqrt[1
- c^2*x^2])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{a+b \arcsin \left(c x\right)}{\sqrt{c d x +d}\, \left(-c f x +f \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x)
```

Maxima [A]
time = 0.49, size = 98, normalized size = 1.00

$$-\frac{\sqrt{-c^{2} d f x^{2} + d f}\, b \arcsin\left(c x\right)}{c^{2} d f^{2} x - c d f^{2}} - \frac{\sqrt{-c^{2} d f x^{2} + d f}\, a}{c^{2} d f^{2} x - c d f^{2}} + \frac{b \log\left(c x - 1\right)}{c \sqrt{d}\, f^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -sqrt(-c^2*d*f*x^2 + d*f)*b*arcsin(c*x)/(c^2*d*f^2*x - c*d*f^2) - sqrt(-c^2
*d*f*x^2 + d*f)*a/(c^2*d*f^2*x - c*d*f^2) + b*log(c*x - 1)/(c*sqrt(d)*f^(3/
2))
```

Fricas [A]
time = 3.43, size = 354, normalized size = 3.61

$$\left[\frac{(bcx-b)\sqrt{df}\,\log\left(\frac{c^6dfx^6-4c^5dfx^5+5c^4dfx^4-4c^2dfx^2+4cdfx-(c^4x^4-4c^3x^3+6c^2x^2-4cx)\sqrt{-c^2x^2+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{df}-2df}{c^4x^4-2c^3x^3+2cx-1}\right)-2\sqrt{cdx+d}\,\sqrt{-cfx+f}\,(b\arcsin(cx)+a)}{2\,(c^2df^2x-cdf^2)}, \frac{(bcx-b)\sqrt{-df}\,\arctan\left(\frac{(c^2x^2-2cx+2)\sqrt{-c^2x^2+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{-df}}{c^4dfx^4-2c^3dfx^3-c^2dfx^2+2cdfx}\right)-\sqrt{cdx+d}\,\sqrt{-cfx+f}\,(b\arcsin(cx)+a)}{c^2df^2x-cdf^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] [1/2*((b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c^5*d*f*x^5 + 5*c^4*d*f*x^
4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*x^3 + 6*c^2*x^2 - 4*c*x)*s
qrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c^4*
x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsi
n(c*x) + a))/(c^2*d*f^2*x - c*d*f^2), ((b*c*x - b)*sqrt(-d*f)*arctan((c^2*x
^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(-d
*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)) - sqrt(c*d*x +
 d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d*f^2*x - c*d*f^2)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\operatorname{asin}(cx)}{\sqrt{d(cx+1)}\,(-f(cx-1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(3/2),x)
[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\operatorname{asin}(c\,x)}{\sqrt{d + c\,d\,x}\,\left(f - c\,f\,x\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(3/2)),x)
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(3/2)), x)
```

3.532 $\int \frac{a+b\textbf{ArcSin}(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=96

$$\frac{x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{b(1-c^2x^2)^{3/2}\log\left(1-c^2x^2\right)}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+1/2*b*(-c
^2*x^2+1)^(3/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A]
time = 0.12, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {4763, 4745, 266}

$$\frac{x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{b(1-c^2x^2)^{3/2}\log\left(1-c^2x^2\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
 + (b*(1 - c^2*x^2)^(3/2)*Log[1 - c^2*x^2])/(2*c*(d + c*d*x)^(3/2)*(f - c*f
*x)^(3/2))
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx &= \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(bc\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{b\left(1-c^2x^2\right)^{3/2}\log\left(1-c^2x^2\right)}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

Mathematica [A]
time = 0.24, size = 105, normalized size = 1.09

$$
\frac{\sqrt{d+cdx}\left(2acx+2bcx\mathrm{ArcSin}(cx)+b\sqrt{1-c^2x^2}\,\log(-f(1+cx))+b\sqrt{1-c^2x^2}\,\log(f-cfx)\right)}{2cd^2f(1+cx)\sqrt{f-cfx}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(2*a*c*x + 2*b*c*x*ArcSin[c*x] + b*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))] + b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x]))/(2*c*d^2*f*(1 + c*x)*Sqrt[f - c*f*x])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$
\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x)
```

Maxima [A]
time = 0.49, size = 86, normalized size = 0.90

$$
\frac{bx\arcsin(cx)}{\sqrt{-c^2dfx^2+df}\,df}+\frac{ax}{\sqrt{-c^2dfx^2+df}\,df}-\frac{b\sqrt{\frac{1}{df}}\,\log\left(x^2-\frac{1}{c^2}\right)}{2\,cdf}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] b*x*arcsin(c*x)/(sqrt(-c^2*d*f*x^2 + d*f)*d*f) + a*x/(sqrt(-c^2*d*f*x^2 + d
*f)*d*f) - 1/2*b*sqrt(1/(d*f))*log(x^2 - 1/c^2)/(c*d*f)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^4*d^2*f^2*
x^4 - 2*c^2*d^2*f^2*x^2 + d^2*f^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{3/2}\,{(f-c\,f\,x)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)), x)
```

3.533 $\int \frac{a+b\text{ArcSin}(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx$

Optimal. Leaf size=255

$$-\frac{bf(1-c^2x^2)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\text{ArcSin}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2fx(1-c^2x^2)^2\left(a+b\text{ArcS}\right.}{3(d+cdx)^{5/2}(f-cfx}$$

```
[Out] -1/6*b*f*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1/3*
f*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2
)+2/3*f*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
+1/6*b*f*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
+1/3*b*f*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/
2)
```

Rubi [A]

time = 0.19, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 653, 197, 4845, 641, 46, 213, 266}

$$\frac{2fx(1-c^2x^2)^2\left(a+b\text{ArcSin}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\text{ArcSin}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf(1-c^2x^2)^{5/2}}{6c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf(1-c^2x^2)^{5/2}\tanh^{-1}(cx)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] -1/6*(b*f*(1 - c^2*x^2)^(5/2))/(c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) - (f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5
/2)*(f - c*f*x)^(5/2)) + (2*f*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d
+ c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/
(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*Log[1
- c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 653

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)/(2*a*c*(p + 1)))*(a + c*x^2)^(p + 1), x] + Dist[d*((2*p + 3)/(2*a
*(p + 1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(f-cfx)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx\right.}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf\left(1-c^2x^2\right)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf\left(1-c^2x^2\right)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f(1-cx)\left(1-c^2x^2\right)\left(a+b\sin^{-1}\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A]
time = 0.33, size = 180, normalized size = 0.71

$$\frac{\sqrt{d+cdx}\left(-4a+8acx+8ac^2x^2-2b\sqrt{1-c^2x^2}+4b(-1+2cx+2c^2x^2)\,\mathrm{ArcSin}(cx)+5b(1+cx)\sqrt{1-c^2x^2}\,\log(-f(1+cx))+3b\sqrt{1-c^2x^2}\,\log(f-cfx)+3bcx\sqrt{1-c^2x^2}\,\log(f-cfx)\right)}{12cd^3f(1+cx)^2\sqrt{f-cfx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-4*a + 8*a*c*x + 8*a*c^2*x^2 - 2*b*Sqrt[1 - c^2*x^2] + 4*
b*(-1 + 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 5*b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Lo
g[-(f*(1 + c*x))] + 3*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 3*b*c*x*Sqrt[1 -
 c^2*x^2]*Log[f - c*f*x]))/(12*c*d^3*f*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{5}{2}}\left(-cfx+f\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x)
```

Maxima [A]
time = 0.50, size = 234, normalized size = 0.92

$$-\frac{1}{12}\,bc\left(\frac{2\,\sqrt{d}\,\sqrt{f}}{c^3d^3f^2x+c^2d^3f^2}-\frac{5\,\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}f^{\frac{3}{2}}}-\frac{3\,\log\left(cx-1\right)}{c^2d^{\frac{5}{2}}f^{\frac{3}{2}}}\right)-\frac{1}{3}\,b\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2d^2fx+\sqrt{-c^2dfx^2+df}\,cd^2f}-\frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f}\right)\arcsin\left(cx\right)-\frac{1}{3}\,a\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2d^2fx+\sqrt{-c^2dfx^2+df}\,cd^2f}-\frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -1/12*b*c*(2*sqrt(d)*sqrt(f)/(c^3*d^3*f^2*x + c^2*d^3*f^2) - 5*log(c*x + 1)
/(c^2*d^(5/2)*f^(3/2)) - 3*log(c*x - 1)/(c^2*d^(5/2)*f^(3/2))) - 1/3*b*(1/(
sqrt(-c^2*d*f*x^2 + d*f)*c^2*d^2*f*x + sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*f) -
2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d^2*f))*arcsin(c*x) - 1/3*a*(1/(sqrt(-c^2*d*f
*x^2 + d*f)*c^2*d^2*f*x + sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*f) - 2*x/(sqrt(-c^
2*d*f*x^2 + d*f)*d^2*f))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^3*f^2*
x^5 + c^4*d^3*f^2*x^4 - 2*c^3*d^3*f^2*x^3 - 2*c^2*d^3*f^2*x^2 + c*d^3*f^2*x
 + d^3*f^2), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3005 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\,\mathrm{asin}(c\,x)}{{(d + c\,d\,x)}^{5/2}\,{(f - c\,f\,x)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)), x)
```

3.534 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=419

$$\frac{bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{8bd^5(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{5bd^5(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2d^5(1+cx)}{3c(d}$$

```
[Out] b*d^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*d^5*(-c^2
*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-5/2*b*d^5*(-c^2*x
^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+2/3*d^5*(c*x+1
)^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-10/3*
d^5*(c*x+1)^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)-5*d^5*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^
(5/2)+5*d^5*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5
/2)/(-c*f*x+f)^(5/2)-28/3*b*d^5*(-c^2*x^2+1)^(5/2)*ln(-c*x+1)/c/(c*d*x+d)^(
5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A]
time = 0.27, antiderivative size = 419, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 683, 655, 222, 4845, 641, 45, 4737}

$$-\frac{5d^5(1-c^2x^2)^3(a+b\text{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{10d^5(cx+1)^2(1-c^2x^2)^2(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^5(cx+1)^4(1-c^2x^2)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{5d^5(1-c^2x^2)^{5/2}\text{ArcSin}(cx)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{5bd^5(1-c^2x^2)^{5/2}\text{ArcSin}(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bd^5x(1-c^2x^2)^{5/2}}{(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{8bd^5(1-c^2x^2)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{28bd^5(1-c^2x^2)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (8*b*
d^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)
) - (5*b*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(f -
 c*f*x)^(5/2)) + (2*d^5*(1 + c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (10*d^5*(1 + c*x)^2*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (5*d^5*(1
 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
+ (5*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*d^5*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
```

```
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}(a+b\sin^{-1}(cx))}{(f-cfx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^5(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{10d^5(1+cx)^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(f-}$$

$$= \frac{5bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{5bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5(1-c^2x^2)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx}{3c(}$$

$$= \frac{5bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5(1-c^2x^2)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx}{3c(}$$

$$= \frac{bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bd^5(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd}{2c}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 850 vs. 2(419) = 838.
time = 3.52, size = 850, normalized size = 2.03

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (d^2*((-4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(23 - 34*c*x + 3*c^2*x^2))/(-1
+ c*x)^2 - 60*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
)/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*
(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] +
2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin
[ArcSin[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2])) + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[
ArcSin[c*x]/2]*(-8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*
```

```
x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 +
3*ArcSin[c*x])) + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 +
 2*(2 + 7*Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin
[c*x]^2 + 28*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]])*Sin[ArcSin[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f
*x]*(2*(-7 + 6*c*x + 3*Cos[2*ArcSin[c*x]] + 52*(-1 + c*x)*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + 18
*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + ArcSin[c*x]*(-
24*Cos[ArcSin[c*x]/2] - 35*Cos[(3*ArcSin[c*x])/2] + 3*Cos[(5*ArcSin[c*x])/2
] - 24*Sin[ArcSin[c*x]/2] + 35*Sin[(3*ArcSin[c*x])/2] + 3*Sin[(5*ArcSin[c*x
])/2])))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]))))/(12*c*f^3)
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{5}{2}} (a+b\arcsin(cx))}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] -1/3*(3*(-c^2*d*f*x^2 + d*f)^(5/2)/(c^5*f^5*x^4 - 4*c^4*f^5*x^3 + 6*c^3*f^5
*x^2 - 4*c^2*f^5*x + c*f^5) + 5*(-c^2*d*f*x^2 + d*f)^(3/2)*d/(c^4*f^4*x^3 -
 3*c^3*f^4*x^2 + 3*c^2*f^4*x - c*f^4) - 10*sqrt(-c^2*d*f*x^2 + d*f)*d^2/(c^
3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) - 35*sqrt(-c^2*d*f*x^2 + d*f)*d^2/(c^2*f^3
*x - c*f^3) - 15*d^3*arcsin(c*x)/(c*f^3*sqrt(d/f)))*a + b*sqrt(d)*integrate
((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)), x)/sqrt(f)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2
*x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*f^3*x^3 - 3*
c^2*f^3*x^2 + 3*c*f^3*x - f^3), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(d+c\,d\,x)}^{5/2}}{{(f-c\,f\,x)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(5/2), x)
```

3.535 $\int \frac{(d+cdx)^{3/2}(a+b\mathbf{ArcSin}(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=324

$$-\frac{4bd^4(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{bd^4(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2d^4(1+cx)^3\,(1-c^2x^2)\,(a+b\text{ArcSin}$$

```
[Out] -4/3*b*d^4*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1
/2*b*d^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2
)+2/3*d^4*(c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*
x+f)^(5/2)-2*d^4*(c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)
/(-c*f*x+f)^(5/2)+d^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c
*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*d^4*(-c^2*x^2+1)^(5/2)*ln(-c*x+1)/c/(c
*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A]
time = 0.25, antiderivative size = 324, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4763, 683, 667, 222, 4845, 641, 45, 31, 4737}

$$-\frac{2d^4(cx+1)\,(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^4(cx+1)^3\,(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{d^4(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^4(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{4bd^4(1-c^2x^2)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{8bd^4(1-c^2x^2)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (-4*b*d^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*d^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (2*d^4*(1 + c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (d^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*d^4*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
```

```
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)\left(1-c^2x^2\right)^2 (}{c(d+cdx)^{5/2}(f-}$$

$$= \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)\left(1-c^2x^2\right)^2 (}{c(d+cdx)^{5/2}(f-}$$

$$= -\frac{bd^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)\left(a+b\sin^{-1}(\right.}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{4bd^4\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd^4\left(1-c^2x^2\right)^{5/2}\sin^{-1}(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A]

time = 2.55, size = 601, normalized size = 1.85

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (d*((16*a*(-1 + 2*c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x)^2 - 12*a
*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt
[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x
]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])
- Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]]) + 2*(2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 2*(2 + Sqrt[1 -
 c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]
))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(-
8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
```

```
n[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*ArcSin[c*x])) +
 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 2*(2 + 7*Sqrt[1
- c^2*x^2])*ArcSin[c*x] - 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 28*(2 +
 Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSi
n[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2
] + Sin[ArcSin[c*x]/2]))))/(12*c*f^3)
```

Maple [F]
time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{(cdx + d)^{\frac{3}{2}} (a + b \arcsin (cx))}{(-cfx + f)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] -b*sqrt(d)*sqrt(f)*integrate((c*d*x + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^3*f^3*x^3 - 3*c^2*f^3*x^2 + 3*c*f^
3*x - f^3), x) - 1/3*a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^4*f^4*x^3 - 3*c^3*f^4
*x^2 + 3*c^2*f^4*x - c*f^4) - 2*sqrt(-c^2*d*f*x^2 + d*f)*d/(c^3*f^3*x^2 - 2
*c^2*f^3*x + c*f^3) - 7*sqrt(-c^2*d*f*x^2 + d*f)*d/(c^2*f^3*x - c*f^3) - 3*
d^2*arcsin(c*x)/(c*f^3*sqrt(d/f)))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^3*f^3*x^3 - 3*c^2*f^3*x^2 + 3*c*f^3*x - f^3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{3/2}}{\left(f-c\,f\,x\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(5/2), x)
```

3.536 $\int \frac{\sqrt{d+cdx}\,(a+b\mathbf{ArcSin}(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=164

$$-\frac{2bd^3(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{d^3(1+cx)^3(1-c^2x^2)(a+b\text{ArcSin}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{bd^3(1-c^2x^2)^{5/2}\log(1-c\ldots}{3c(d+cdx)^{5/2}(f-cfx)^{5\ldots}}$$

```
[Out] -2/3*b*d^3*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1
/3*d^3*(c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)-1/3*b*d^3*(-c^2*x^2+1)^(5/2)*ln(-c*x+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)
```

Rubi [A]
time = 0.18, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 665, 4845, 12, 641, 45}

$$\frac{d^3(cx+1)^3(1-c^2x^2)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2bd^3(1-c^2x^2)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^3(1-c^2x^2)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (-2*b*d^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (d^3*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^3*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
```

```
rQ[m + p]))
```

Rule 665

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^m*((a + c*x^2)^(p + 1)/(2*c*d*(p + 1))), x] /; FreeQ[{a, c, d,
e, m, p}, x] && EqQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p] && EqQ[m + 2*p + 2,
0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\,(a+b\sin^{-1}(cx))}{(f-cfx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^3(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int \frac{d^3(1+cx)^3}{3c(1-c^2x^2)}}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3(1-c^2x^2)^{5/2}\right)\int \frac{(1+cx)^3}{(1-c^2x^2)^2}}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3(1-c^2x^2)^{5/2}\right)\int \frac{1+cx}{(1-cx)^2}\,d}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3(1-c^2x^2)^{5/2}\right)\int \left(\frac{2}{(-1+cx}\right.}{3(d+cdx)^{5/2}(f-c}$$

$$= -\frac{2bd^3(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^3(1+cx)^3(1-c^2x^2)(a+b\sin}{3c(d+cdx)^{5/2}(f-cfx)^5}$$

Mathematica [A]
time = 0.26, size = 126, normalized size = 0.77

$$\frac{\sqrt{d+cdx}\,\sqrt{f-cfx}\left((1+cx)\left(-b+bcx+a\sqrt{1-c^2x^2}\right)+b(1+cx)\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)-b(-1+cx)^2\log(f-cfx)\right)}{3cf^3(-1+cx)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*((1 + c*x)*(-b + b*c*x + a*Sqrt[1 - c^2*x^
2]) + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - b*(-1 + c*x)^2*Log[f - c*
f*x]))/(3*c*f^3*(-1 + c*x)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Maxima [A]
time = 0.50, size = 217, normalized size = 1.32

$$\frac{1}{3}\,bc\left(\frac{2\,\sqrt{d}}{c^{3}f^{\frac{5}{2}}x - c^{2}f^{\frac{5}{2}}} - \frac{\sqrt{d}\,\log\left(cx-1\right)}{c^{2}f^{\frac{5}{2}}}\right) + \frac{1}{3}\,b\left(\frac{2\,\sqrt{-c^{2}dfx^{2}+df}}{c^{3}f^{3}x^{2} - 2\,c^{2}f^{3}x + cf^{3}} + \frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{2}f^{3}x - cf^{3}}\right)\arcsin\left(cx\right) + \frac{1}{3}\,a\left(\frac{2\,\sqrt{-c^{2}dfx^{2}+df}}{c^{3}f^{3}x^{2} - 2\,c^{2}f^{3}x + cf^{3}} + \frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{2}f^{3}x - cf^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/3*b*c*(2*sqrt(d)/(c^3*f^(5/2)*x - c^2*f^(5/2)) - sqrt(d)*log(c*x - 1)/(c^
2*f^(5/2))) + 1/3*b*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*f^3*x^2 - 2*c^2*f^3*x
+ c*f^3) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*f^3*x - c*f^3))*arcsin(c*x) + 1/3*
a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) + sqrt(-c
^2*d*f*x^2 + d*f)/(c^2*f^3*x - c*f^3))
```

Fricas [A]
time = 1.47, size = 520, normalized size = 3.17

$$\left[\frac{\left(bc^{3}fx^{3} - bc^{2}fx^{2} - bcfx + bf\right)\sqrt{\frac{d}{f}}\,\log\left(\frac{c^{6}dx^{6} - 4\,c^{5}dx^{5} + 5\,c^{4}dx^{4} - 4\,c^{2}dx^{2} + 4\,cdx + \left(c^{4}x^{4} - 4\,c^{3}x^{3} + 6\,c^{2}x^{2} - 4\,cx\right)\sqrt{-c^{2}x^{2}+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{\frac{d}{f}} - 2\,d}{c^{4}x^{4} - 2\,c^{3}x^{3} + 2\,cx - 1}\right) + 2\left(ac^{2}x^{2} - 2\,\sqrt{-c^{2}x^{2}+1}\,bcx + 2\,acx + \left(bc^{2}x^{2} + 2\,bcx + b\right)\arcsin\left(cx\right) + a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{6\left(c^{4}f^{3}x^{3} - c^{3}f^{3}x^{2} - c^{2}f^{3}x + cf^{3}\right)},\ -\frac{\left(bc^{3}fx^{3} - bc^{2}fx^{2} - bcfx + bf\right)\sqrt{-\frac{d}{f}}\,\arctan\left(\frac{\left(c^{2}x^{2} - 2\,cx + 2\right)\sqrt{-c^{2}x^{2}+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{-\frac{d}{f}}}{c^{4}dx^{4} - 2\,c^{3}dx^{3} - c^{2}dx^{2} + 2\,cdx}\right) - \left(ac^{2}x^{2} - 2\,\sqrt{-c^{2}x^{2}+1}\,bcx + 2\,acx + \left(bc^{2}x^{2} + 2\,bcx + b\right)\arcsin\left(cx\right) + a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{3\left(c^{4}f^{3}x^{3} - c^{3}f^{3}x^{2} - c^{2}f^{3}x + cf^{3}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*f*x^3 - b*c^2*f*x^2 - b*c*f*x + b*f)*sqrt(d/f)*log((c^6*d*x^6
- 4*c^5*d*x^5 + 5*c^4*d*x^4 - 4*c^2*d*x^2 + 4*c*d*x + (c^4*x^4 - 4*c^3*x^3
+ 6*c^2*x^2 - 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sq
rt(d/f) - 2*d)/(c^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) + 2*(a*c^2*x^2 - 2*sqrt(-
c^2*x^2 + 1)*b*c*x + 2*a*c*x + (b*c^2*x^2 + 2*b*c*x + b)*arcsin(c*x) + a)*s
qrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*f^3*x^3 - c^3*f^3*x^2 - c^2*f^3*x + c
*f^3), -1/3*((b*c^3*f*x^3 - b*c^2*f*x^2 - b*c*f*x + b*f)*sqrt(-d/f)*arctan(
(c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*s
qrt(-d/f)/(c^4*d*x^4 - 2*c^3*d*x^3 - c^2*d*x^2 + 2*c*d*x)) - (a*c^2*x^2 - 2
*sqrt(-c^2*x^2 + 1)*b*c*x + 2*a*c*x + (b*c^2*x^2 + 2*b*c*x + b)*arcsin(c*x)
 + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*f^3*x^3 - c^3*f^3*x^2 - c^2*f^
3*x + c*f^3)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\left(cx+1\right)}\,\left(a + b\operatorname{asin}\left(cx\right)\right)}{\left(-f\left(cx-1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/(-f*(c*x - 1))**(5/2), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}}{{(f-c\,f\,x)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(5/2), x)
```

3.537 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+cdx}\,(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=265

$$-\frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2d^2(1+cx)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{d^2x(1-c^2x^2)^2\,(a+b\text{Arc}}{3(d+cdx)^{5/2}(f-cf}$$

```
[Out] -1/3*b*d^2*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+2
/3*d^2*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^
(5/2)+1/3*d^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)-1/3*b*d^2*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+
f)^(5/2)+1/6*b*d^2*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*
f*x+f)^(5/2)
```

Rubi [A]
time = 0.21, antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 667, 197, 4845, 641, 46, 213, 266}

$$\frac{d^2x(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{2d^2(cx+1)\left(1-c^2x^2\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bd^2(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd^2(1-c^2x^2)^{5/2}\tanh^{-1}(cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```

```
[Out] -1/3*(b*d^2*(1 - c^2*x^2)^(5/2))/(c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^2*(1 - c^2*x^2)^(5/2)*ArcTan
h[c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d^2*(1 - c^2*x^2)^(5
/2)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+cdx}\,(f-cfx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^2(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\sin^{-1}}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\sin^{-1}}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A]
time = 0.24, size = 130, normalized size = 0.49

$$\frac{\sqrt{d+cdx}\,\sqrt{f-cfx}\left(-\left((-2+cx)\left(-b+bcx+a\sqrt{1-c^2x^2}\right)\right)-b(-2+cx)\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)+b(-1+cx)^2\log(f-cfx)\right)}{3cdf^3(-1+cx)^2\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-((-2 + c*x)*(-b + b*c*x + a*Sqrt[1 - c^2
*x^2])) - b*(-2 + c*x)*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + b*(-1 + c*x)^2*Log[f
 - c*f*x]))/(3*c*d*f^3*(-1 + c*x)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}\,\left(-cfx+f\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x)
```

Maxima [A]
time = 0.50, size = 227, normalized size = 0.86

$$\frac{1}{3}\,bc\left(\frac{1}{c^{3}\sqrt{d}\,f^{\frac{5}{2}}x-c^{2}\sqrt{d}\,f^{\frac{5}{2}}}+\frac{\log\left(cx-1\right)}{c^{2}\sqrt{d}\,f^{\frac{5}{2}}}\right)+\frac{1}{3}\,b\left(\frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{3}df^{3}x^{2}-2\,c^{2}df^{3}x+cdf^{3}}-\frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{2}df^{3}x-cdf^{3}}\right)\arcsin\left(cx\right)+\frac{1}{3}\,a\left(\frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{3}df^{3}x^{2}-2\,c^{2}df^{3}x+cdf^{3}}-\frac{\sqrt{-c^{2}dfx^{2}+df}}{c^{2}df^{3}x-cdf^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/3*b*c*(1/(c^3*sqrt(d)*f^(5/2)*x - c^2*sqrt(d)*f^(5/2)) + log(c*x - 1)/(c^
2*sqrt(d)*f^(5/2))) + 1/3*b*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d*f^3*x^2 - 2*c^
2*d*f^3*x + c*d*f^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d*f^3*x - c*d*f^3))*ar
csin(c*x) + 1/3*a*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d*f^3*x^2 - 2*c^2*d*f^3*x
+ c*d*f^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d*f^3*x - c*d*f^3))
```

Fricas [A]
time = 2.55, size = 527, normalized size = 1.99

$$\left[\frac{\left(bc^{3}x^{3}-bc^{2}x^{2}-bcx+b\right)\sqrt{df}\,\log\left(\frac{c^{6}dfx^{6}-4\,c^{5}dfx^{5}+5\,c^{4}dfx^{4}-4\,c^{2}dfx^{2}+4\,cdfx-\left(c^{4}x^{4}-4\,c^{3}x^{3}+6\,c^{2}x^{2}-4\,cx\right)\sqrt{-c^{2}x^{2}+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{df}-2\,df}{c^{4}x^{4}-2\,c^{3}x^{3}+2\,cx-1}\right)-2\left(ac^{2}x^{2}+\sqrt{-c^{2}x^{2}+1}\,bcx-acx+\left(bc^{2}x^{2}-bcx-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{6\left(c^{4}df^{3}x^{3}-c^{3}df^{3}x^{2}-c^{2}df^{3}x+cdf^{3}\right)},\ \frac{\left(bc^{3}x^{3}-bc^{2}x^{2}-bcx+b\right)\sqrt{-df}\,\arctan\left(\frac{\left(c^{2}x^{2}-2\,cx+2\right)\sqrt{-c^{2}x^{2}+1}\,\sqrt{cdx+d}\,\sqrt{-cfx+f}\,\sqrt{-df}}{c^{4}dfx^{4}-2\,c^{3}dfx^{3}-c^{2}dfx^{2}+2\,cdfx}\right)-\left(ac^{2}x^{2}+\sqrt{-c^{2}x^{2}+1}\,bcx-acx+\left(bc^{2}x^{2}-bcx-2\,b\right)\arcsin\left(cx\right)-2\,a\right)\sqrt{cdx+d}\,\sqrt{-cfx+f}}{3\left(c^{4}df^{3}x^{3}-c^{3}df^{3}x^{2}-c^{2}df^{3}x+cdf^{3}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c^
5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*x^
3 + 6*c^2*x^2 - 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(d*f) - 2*d*f)/(c^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*(a*c^2*x^2 + sqrt
(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2*b)*arcsin(c*x) - 2*a)
*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 - c^3*d*f^3*x^2 - c^2*d*f
^3*x + c*d*f^3), 1/3*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(-d*f)*arctan
((c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(-d*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)) - (a*c^
2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2*b)*arcsin
(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 - c^3*d*f^3*x
^2 - c^2*d*f^3*x + c*d*f^3)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\operatorname{asin}\left(cx\right)}{\sqrt{d\left(cx+1\right)}\left(-f\left(cx-1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(5/2)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{\sqrt{d+c\,d\,x}\,{\left(f-c\,f\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(5/2)), x)
```

3.538 $\int \frac{a+b\mathbf{ArcSin}(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=255

$$-\frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{d(1+cx)\left(1-c^2x^2\right)\left(a+b\text{ArcSin}(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2dx(1-c^2x^2)^2\left(a+b\text{ArcSin}\right.}{3(d+cdx)^{5/2}(f-cfx)^{5}}$$

```
[Out] -1/6*b*d*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1/3
*d*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2
)+2/3*d*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
-1/6*b*d*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
+1/3*b*d*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/
2)
```

Rubi [A]
time = 0.18, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {4763, 653, 197, 4845, 641, 46, 213, 266}

$$\frac{2dx(1-c^2x^2)^2\left(a+b\text{ArcSin}(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{d(cx+1)\left(1-c^2x^2\right)\left(a+b\text{ArcSin}(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bd(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bd(1-c^2x^2)^{5/2}\tanh^{-1}(cx)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] -1/6*(b*d*(1 - c^2*x^2)^(5/2))/(c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) + (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5
/2)*(f - c*f*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d
+ c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/
(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d*(1 - c^2*x^2)^(5/2)*Log[1
- c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 653

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)/(2*a*c*(p + 1)))*(a + c*x^2)^(p + 1), x] + Dist[d*((2*p + 3)/(2*a
*(p + 1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)(a+b\sin^{-1}(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)(1-c^2x^2)(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\sin^{-1}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d(1+cx)(1-c^2x^2)(a+b\sin^{-1}(c}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d(1+cx)(1-c^2x^2)(a+b\sin^{-1}(c}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A]
time = 0.33, size = 184, normalized size = 0.72

$$\frac{\sqrt{d+cdx}\left(-4a-8acx+8ac^2x^2+2b\sqrt{1-c^2x^2}+4b(-1-2cx+2c^2x^2)\operatorname{ArcSin}(cx)+3b(-1+cx)\sqrt{1-c^2x^2}\log(-f(1+cx))-5b\sqrt{1-c^2x^2}\log(f-cfx)+5bcx\sqrt{1-c^2x^2}\log(f-cfx)\right)}{12cd^2f^2\sqrt{f-cfx}(-1+c^2x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-4*a - 8*a*c*x + 8*a*c^2*x^2 + 2*b*Sqrt[1 - c^2*x^2] + 4*
b*(-1 - 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 3*b*(-1 + c*x)*Sqrt[1 - c^2*x^2]*L
og[-(f*(1 + c*x))] - 5*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 5*b*c*x*Sqrt[1
- c^2*x^2]*Log[f - c*f*x]))/(12*c*d^2*f^2*Sqrt[f - c*f*x]*(-1 + c^2*x^2))
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x)
```

[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x)

Maxima [A]
time = 0.51, size = 237, normalized size = 0.93

$$\frac{1}{12}bc\left(\frac{2\sqrt{d}\sqrt{f}}{c^3d^2f^3x-c^2d^2f^3}+\frac{3\log(cx+1)}{c^2d^{\frac{3}{2}}f^{\frac{5}{2}}}+\frac{5\log(cx-1)}{c^2d^{\frac{3}{2}}f^{\frac{5}{2}}}\right)-\frac{1}{3}b\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2df^2x-\sqrt{-c^2dfx^2+df}\,cdf^2}-\frac{2x}{\sqrt{-c^2dfx^2+df}\,df^2}\right)\arcsin(cx)-\frac{1}{3}a\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2df^2x-\sqrt{-c^2dfx^2+df}\,cdf^2}-\frac{2x}{\sqrt{-c^2dfx^2+df}\,df^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/12*b*c*(2*sqrt(d)*sqrt(f)/(c^3*d^2*f^3*x - c^2*d^2*f^3) + 3*log(c*x + 1)/
(c^2*d^(3/2)*f^(5/2)) + 5*log(c*x - 1)/(c^2*d^(3/2)*f^(5/2))) - 1/3*b*(1/(s
qrt(-c^2*d*f*x^2 + d*f)*c^2*d*f^2*x - sqrt(-c^2*d*f*x^2 + d*f)*c*d*f^2) - 2
*x/(sqrt(-c^2*d*f*x^2 + d*f)*d*f^2))*arcsin(c*x) - 1/3*a*(1/(sqrt(-c^2*d*f*
x^2 + d*f)*c^2*d*f^2*x - sqrt(-c^2*d*f*x^2 + d*f)*c*d*f^2) - 2*x/(sqrt(-c^2
*d*f*x^2 + d*f)*d*f^2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^2*f^3
*x^5 - c^4*d^2*f^3*x^4 - 2*c^3*d^2*f^3*x^3 + 2*c^2*d^2*f^3*x^2 + c*d^2*f^3*
x - d^2*f^3), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3005 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{3/2}\,{(f-c\,f\,x)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)), x)
```

3.539 $\int \frac{a+b\mathbf{ArcSin}(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx$

Optimal. Leaf size=188

$$-\frac{b(1-c^2x^2)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2x(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{b(1-c^2x}{3c(d+c}$$

```
[Out] -1/6*b*(-c^2*x^2+1)^(3/2)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1/3*x*(-c^2*x^
2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+2/3*x*(-c^2*x^2+1)^
2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1/3*b*(-c^2*x^2+1)^(5/
2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A]
time = 0.16, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {4763, 4747, 4745, 266, 267}

$$\frac{2x(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{b(1-c^2x^2)^{3/2}}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{b(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] -1/6*(b*(1 - c^2*x^2)^(3/2))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) +
 (2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (b*(1 - c^2*x^2)^(5/2)*Log[1 - c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(
f - c*f*x)^(5/2))
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{a+b\sin^{-1}(cx)}{\left(1-c^2x^2\right)^{3/2}}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1\right.}{3(a}$$

$$= -\frac{b\left(1-c^2x^2\right)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2x(1-c^2}{3(d+c}$$

$$= -\frac{b\left(1-c^2x^2\right)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2x(1-c^2}{3(d+c}$$

Mathematica [A]
time = 0.30, size = 178, normalized size = 0.95

$$\frac{\sqrt{d+cdx}\left(-6acx+4ac^3x^3+b\sqrt{1-c^2x^2}+2bcx\left(-3+2c^2x^2\right)\text{ArcSin}(cx)-2b\left(1-c^2x^2\right)^{3/2}\log(-f(1+cx))-2b\sqrt{1-c^2x^2}\log(f-cfx)+2bc^2x^2\sqrt{1-c^2x^2}\log(f-cfx)\right)}{6cd^3(-1+cx)\sqrt{f-cfx}\,(f+cfx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*c*x*(-
3 + 2*c^2*x^2)*ArcSin[c*x] - 2*b*(1 - c^2*x^2)^(3/2)*Log[-(f*(1 + c*x))] -
2*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 2*b*c^2*x^2*Sqrt[1 - c^2*x^2]*Log[f
- c*f*x]))/(6*c*d^3*(-1 + c*x)*Sqrt[f - c*f*x]*(f + c*f*x)^2)
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{a+b \arcsin \left(c x\right)}{\left(c d x+d\right)^{\frac{5}{2}} \left(-c f x+f\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x)
```

Maxima [A]
time = 0.50, size = 177, normalized size = 0.94

$$\frac{1}{6}\, bc \left(\frac{1}{c^4 d^{\frac{5}{2}} f^{\frac{5}{2}} x^2 - c^2 d^{\frac{5}{2}} f^{\frac{5}{2}}} + \frac{2\, \log\left(cx+1\right)}{c^2 d^{\frac{5}{2}} f^{\frac{5}{2}}} + \frac{2\, \log\left(cx-1\right)}{c^2 d^{\frac{5}{2}} f^{\frac{5}{2}}}\right) + \frac{1}{3}\, b \left(\frac{x}{\left(-c^2 d f x^2 + d f\right)^{\frac{3}{2}} d f} + \frac{2\, x}{\sqrt{-c^2 d f x^2 + d f}\, d^2 f^2}\right) \arcsin\left(cx\right) + \frac{1}{3}\, a \left(\frac{x}{\left(-c^2 d f x^2 + d f\right)^{\frac{3}{2}} d f} + \frac{2\, x}{\sqrt{-c^2 d f x^2 + d f}\, d^2 f^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/6*b*c*(1/(c^4*d^(5/2)*f^(5/2)*x^2 - c^2*d^(5/2)*f^(5/2)) + 2*log(c*x + 1)
/(c^2*d^(5/2)*f^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2)*f^(5/2))) + 1/3*b*(x/(
(-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d^2*f^2))*a
rcsin(c*x) + 1/3*a*(x/((-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2*d*f
*x^2 + d*f)*d^2*f^2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^6*d^3*f^3
*x^6 - 3*c^4*d^3*f^3*x^4 + 3*c^2*d^3*f^3*x^2 - d^3*f^3), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6190 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(d+c\,d\,x\right)}^{5/2}\,{\left(f-c\,f\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)), x)
```

3.540 $\int (d+cdx)^{5/2}\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=613

$$\frac{8b^2d^2\sqrt{d+cdx}\,\sqrt{e-cex}}{9c}-\frac{15}{64}b^2d^2x\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{4b^2d^2\sqrt{d+c}}{}$$

```
[Out] 8/9*b^2*d^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*d^2*x*(c*d*x+d)^(1
/2)*(-c*e*x+e)^(1/2)-1/32*b^2*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+
4/27*b^2*d^2*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+3/8*d^2*x*(a+b
*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/4*c^2*d^2*x^3*(a+b*arcsi
n(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-2/3*d^2*(-c^2*x^2+1)*(a+b*arcsin
(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+15/64*b^2*d^2*arcsin(c*x)*(c*d*
x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)+4/3*b*d^2*x*(a+b*arcsin(c*
x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-3/8*b*c*d^2*x^2*(a+
b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-4/9*b*c^
2*d^2*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(
1/2)-1/8*b*c^3*d^2*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(
-c^2*x^2+1)^(1/2)+5/24*d^2*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(
1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.71, antiderivative size = 613, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4783, 4795}

$$\frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2-\frac{3bcd^2x^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{8\sqrt{1-c^2x^2}}+\frac{4bd^2x\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{5d^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^3}{24bc\sqrt{1-c^2x^2}}-\frac{2d^2(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{3c}-\frac{4bc^2d^2x^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}-\frac{bc^3d^2x^4\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{8\sqrt{1-c^2x^2}}+\frac{3}{8}d^2x\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2+\frac{15b^2d^2\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{64c\sqrt{1-c^2x^2}}-\frac{1}{32}b^2c^2d^2x^3\sqrt{cdx+d}\,\sqrt{e-cex}+\frac{4b^2d^2(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}}{27c}-\frac{15}{64}b^2d^2x\sqrt{cdx+d}\,\sqrt{e-cex}+\frac{8b^2d^2\sqrt{cdx+d}\,\sqrt{e-cex}}{9c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (8*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*d^2*x*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x])/32 + (4*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c) +
 (15*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c^
2*x^2]) + (4*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(
3*Sqrt[1 - c^2*x^2]) - (3*b*c*d^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (4*b*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2*x^4*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) +
 (3*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*d
^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 - (2*d^2*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
(5*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt[
1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
```

```
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
```

```
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int (d+cdx)^{5/2}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int (d+cdx)^2\sqrt{1-c^2x^2}\,(a+b\sin^{-}}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \left(d^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2\right.}{}$$

$$= \frac{\left(d^2\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}d^2x\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2 + \frac{1}{4}c^2d^2x^3\sqrt{d}$$

$$= \frac{4bd^2x\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))}{3\sqrt{1-c^2x^2}} - \frac{bcd^2x^2\sqrt{d+}}{}$$

$$= -\frac{1}{4}b^2d^2x\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\,\sqrt{e}$$

$$= -\frac{15}{64}b^2d^2x\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\,\sqrt{e}$$

$$= \frac{8b^2d^2\sqrt{d+cdx}\,\sqrt{e-cex}}{9c} - \frac{15}{64}b^2d^2x\sqrt{d+cdx}\,\sqrt{e-cex}$$

Mathematica [A]
time = 1.43, size = 555, normalized size = 0.91

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (1440*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*d^(5
/2)*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/
(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt[1 -
 c^2*x^2] + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]] + 288*a*Sin[2
*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] - 36*a*Sin[4*ArcSin[c*x]]) - 72*b*d
^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(-60*a + 48*b*Sqrt[1 - c^2
*x^2] + 16*b*Cos[3*ArcSin[c*x]] - 24*b*Sin[2*ArcSin[c*x]] + 3*b*Sin[4*ArcSi
n[c*x]]) + d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*ArcSin[c*x]]
 + 256*b^2*Cos[3*ArcSin[c*x]] + 3*(3072*a*b*c*x - 1024*a*b*c^3*x^3 - 1536*a
^2*Sqrt[1 - c^2*x^2] + 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*Sqrt[1 - c^
2*x^2] + 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*Sqrt[1 - c^2*
x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]] + 9*b^2*Sin[4
*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \left(cdx+d\right)^{\frac{5}{2}} \left(a+b\arcsin\left(cx\right)\right)^{2} \sqrt{-cex+e}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] -1/24*(6*(-c^2*d*x^2*e + d*e)^(3/2)*d*x*e^(-1) - 15*sqrt(-c^2*d*x^2*e + d*e
)*d^2*x - 15*d^(5/2)*arcsin(c*x)*e^(1/2)/c + 16*(-c^2*d*x^2*e + d*e)^(3/2)*
d*e^(-1)/c)*a^2 + sqrt(d)*e^(1/2)*integrate(((b^2*c^2*d^2*x^2 + 2*b^2*c*d^2
*x + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d^2
*x^2 + 2*a*b*c*d^2*x + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2*
b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x +
 a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2*(-c*e*x+e)**(1/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 8568 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\right)}^{5/2}\,\sqrt{e-c\,e\,x}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(1/2), x)
```

3.541 $\int (d+cdx)^{3/2}\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=455

$$\frac{4b^2d\sqrt{d+cdx}\,\sqrt{e-cex}}{9c}-\frac{1}{4}b^2dx\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{2b^2d\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)}{27c}+\frac{b^2d\sqrt{d+cd}}{4}$$

```
[Out] 4/9*b^2*d*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-1/4*b^2*d*x*(c*d*x+d)^(1/2)*(-
c*e*x+e)^(1/2)+2/27*b^2*d*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+1
/2*d*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-1/3*d*(-c^2*x^2
+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+1/4*b^2*d*arcsin
(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/3*b*d*x*(a+b*
arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*b*c*d*
x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2
/9*b*c^2*d*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2
+1)^(1/2)+1/6*d*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c/(-
c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.42, antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45}

$$-\frac{bcdx^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{d\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^3}{6bc\sqrt{1-c^2x^2}}-\frac{d(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{3c}-\frac{2bc^2dx^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}+\frac{1}{2}dx\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2+\frac{b^2d\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}}+\frac{2b^2d(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}}{27c}-\frac{1}{4}b^2dx\sqrt{cdx+d}\,\sqrt{e-cex}+\frac{4b^2d\sqrt{cdx+d}\,\sqrt{e-cex}}{9c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*d*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x])/4 + (2*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)
)/(27*c) + (b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
- c^2*x^2]) + (2*b*d*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*
ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (2*b*c^2*d*x^3*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 - (d*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
```

```
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int (d+cdx)^{3/2}\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int (d+cdx)\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \left(d\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2\,d}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}dx\sqrt{d+cdx}\,\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d\sqrt{d+cdx}}{}$$

$$= \frac{2bdx\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))}{3\sqrt{1-c^2x^2}} - \frac{bcdx^2\sqrt{d+c}}{}$$

$$= -\frac{1}{4}b^2dx\sqrt{d+cdx}\,\sqrt{e-cex} + \frac{2bdx\sqrt{d+cdx}\,\sqrt{e-cex}\,(}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2dx\sqrt{d+cdx}\,\sqrt{e-cex} + \frac{b^2d\sqrt{d+cdx}\,\sqrt{e-cex}\,\sin}{4c\sqrt{1-c^2x^2}}$$

$$= \frac{4b^2d\sqrt{d+cdx}\,\sqrt{e-cex}}{9c} - \frac{1}{4}b^2dx\sqrt{d+cdx}\,\sqrt{e-cex} +$$

<u>Mathematica</u> [A]
time = 1.07, size = 437, normalized size = 0.96

$$\frac{36b^2d\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3 - 108a^2d^{3/2}\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right) - 18bd\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2\left(-6a+3b\sqrt{1-c^2x^2}+b\cos(3\mathrm{ArcSin}(cx))-3b\sin(2\mathrm{ArcSin}(cx))\right) + d\sqrt{d+cdx}\,\sqrt{e-cex}\left(12\left(9b^2\sqrt{1-c^2x^2}-4abcx(-3+c^2x^2)+3a^2\sqrt{1-c^2x^2}(-2+3cx+2c^2x^2)\right)+54ab\cos(2\mathrm{ArcSin}(cx))+4b^2\cos(3\mathrm{ArcSin}(cx))-27b^2\sin(2\mathrm{ArcSin}(cx))\right) + 6bd\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)\left(9b\cos(2\mathrm{ArcSin}(cx))+2\left(9bcx-12a\sqrt{1-c^2x^2}+12ac^2x^2\sqrt{1-c^2x^2}+9a\sin(2\mathrm{ArcSin}(cx))+b\sin(3\mathrm{ArcSin}(cx))\right)\right)}{216c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (36*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*d^(3/2)*S
qrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt
[d]*Sqrt[e]*(-1 + c^2*x^2))] - 18*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSi
n[c*x]^2*(-6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] - 3*b*Sin[2*A
rcSin[c*x]]) + d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(12*(9*b^2*Sqrt[1 - c^2*x^
2] - 4*a*b*c*x*(-3 + c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x + 2*c^2
*x^2)) + 54*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] - 27*b^2*Sin[
2*ArcSin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(9*b*Co
s[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^2*x^2*Sqrt[
```

```
1 - c^2*x^2] + 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))/(216*c*Sqrt
[1 - c^2*x^2])
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{3}{2}} (a+b\arcsin(cx))^2 \sqrt{-cex+e}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="maxima")
[Out] 1/6*(3*sqrt(-c^2*d*x^2*e + d*e)*d*x + 3*d^(3/2)*arcsin(c*x)*e^(1/2)/c - 2*(
-c^2*d*x^2*e + d*e)^(3/2)*e^(-1)/c)*a^2 + sqrt(d)*e^(1/2)*integrate(((b^2*c
*d*x + b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c*d*x +
 a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x
 + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="fricas")
[Out] integral((a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c*
d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (d(cx+1))^{\frac{3}{2}} \sqrt{-e(cx-1)} (a+b\operatorname{asin}(cx))^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2*(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,\sqrt{e-c\,e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(1/2), x)
```

3.542 $\int \sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=222

$$-\frac{1}{4}b^2x\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)}{4c\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(c$$

```
[Out] -1/4*b^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/2*x*(c*d*x+d)^(1/2)*(-c*e*x+e
)^(1/2)*(a+b*arcsin(c*x))^2+1/4*b^2*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-
c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.21, antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {4763, 4741, 4737, 4723, 327, 222}

$$\frac{\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^3}{6bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2+\frac{b^2\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}}-\frac{1}{4}b^2x\sqrt{cdx+d}\,\sqrt{e-cex}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
```

```
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}x\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(\sqrt{d+cdx}\,\sqrt{e\cdots\right.}{\cdots}$$

$$= -\frac{bcx^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx\cdots}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{bcx^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(a\cdots}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\,\sqrt{e-cex} + \frac{b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\sin^{-1}\cdots}{4c\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.58, size = 288, normalized size = 1.30

$$\frac{4b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-12a^2\sqrt{d}\,\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)+6b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)(b\cos(2\mathrm{ArcSin}(cx))+2a\sin(2\mathrm{ArcSin}(cx)))+6b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2(2a+b\sin(2\mathrm{ArcSin}(cx)))+3\sqrt{d+cdx}\,\sqrt{e-cex}\left(4a^2cx\sqrt{1-c^2x^2}+2ab\cos(2\mathrm{ArcSin}(cx))-b^2\sin(2\mathrm{ArcSin}(cx))\right)}{24c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*Sqrt[
e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*
Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*
(b*Cos[2*ArcSin[c*x]] + 2*a*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*ArcSin[c*x]^2*(2*a + b*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(4*a^2*c*x*Sqrt[1 - c^2*x^2] + 2*a*b*Cos[2*ArcSin[c*x]] - b^
2*Sin[2*ArcSin[c*x]]))/(24*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}\,\left(a+b\arcsin\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/2*(sqrt(-c^2*d*x^2*e + d*e)*x + sqrt(d)*arcsin(c*x)*e^(1/2)/c)*a^2 + sqrt
(d)*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2
*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d\,(cx+1)}\,\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.543 $\int \frac{\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=230

$$-\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{2b^2e(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{2b^2ex\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{e(1-c^2x^2)\,(a+b\text{ArcSin}(c$$

```
[Out] -2*b^2*e*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+e*(-c^2*x^2+1)*(a+
b*arcsin(c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*a*b*e*x*(-c^2*x^2+1)^
(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b^2*e*x*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*e*(a+b*arcsin(c*x))^3*(-c^2*x^2+1
)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.32, antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {4763, 4847, 4737, 4767, 4715, 267}

$$\frac{e\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{e(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2b^2ex\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2b^2e(1-c^2x^2)}{c\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (-2*a*b*e*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e
*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e*x*Sqrt[1 - c
^2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*(1 - c^2*x^2)*(
a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\int \left(\frac{e(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}} - \frac{cex(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\left(e\sqrt{1-c^2x^2}\right)\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{\left(ce\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\sin^{-1}(cx))^{}}{\sqrt{1-c^2x^2}}}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{e(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{e\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{(2b}{}$$

$$= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{e(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{e\sqrt{1-c^2x}}{3bc\sqrt{d+}}$$

$$= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{2b^2ex\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{e(1-c^2x^2)\,(}{c\sqrt{d+cd}}$$

$$= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{2b^2e(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{2b^2ex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e}}$$

Mathematica [A]
time = 0.58, size = 296, normalized size = 1.29

$$\frac{3\sqrt{d+cdx}\,\sqrt{e-cex}\left(-2abcx+a^2\sqrt{1-c^2x^2}-2b^2\sqrt{1-c^2x^2}\right)-6b\sqrt{d+cdx}\,\sqrt{e-cex}\left(bcx-a\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)+3b\sqrt{d+cdx}\,\sqrt{e-cex}\left(a+b\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)^2+b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-3a^2\sqrt{d}\,\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)}{3cd\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-2*a*b*c*x + a^2*Sqrt[1 - c^2*x^2] - 2*
b^2*Sqrt[1 - c^2*x^2]) - 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(b*c*x - a*Sqr
t[1 - c^2*x^2])*ArcSin[c*x] + 3*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*Sq
rt[1 - c^2*x^2])*ArcSin[c*x]^2 + b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin
[c*x]^3 - 3*a^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))]])/(3*c*d*Sqrt[1 - c^2*
x^2])
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-cex+e}}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="maxima")
```

```
[Out] a^2*(arcsin(c*x)*e^(1/2)/(c*sqrt(d)) + sqrt(-c^2*d*x^2*e + d*e)/(c*d)) + sq
rt(d)*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 +
 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x
+ 1)/(c*d*x + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(-(c*x - 1)*e)/s
qrt(c*d*x + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-e\left(cx-1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{\sqrt{d\left(cx+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(1/2),x)
```

```
[Out] Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/sqrt(d*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{e-c\,e\,x}}{\sqrt{d+c\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(1/2), x)
```

3.544 $\int \frac{\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=530

$$-\frac{2e^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2e^2x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{2ie^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] -2*e^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+
2*e^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2
*I*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^
(3/2)-1/3*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-
c*e*x+e)^(3/2)-8*I*b*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+
(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*b*e^2*(-c^2*x^2+1)
^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/
2)/(-c*e*x+e)^(3/2)+4*I*b^2*e^2*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^
2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b^2*e^2*(-c^2*x^2+1
)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e
)^(3/2)-2*I*b^2*e^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A]
time = 0.67, antiderivative size = 530, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737}

$$-\frac{8ibe^2(1-c^2x^2)^{3/2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{e^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^3}{3bc(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ie^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2e^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2e^2x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4be^2(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4ib^2e^2(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2e^2(1-c^2x^2)^{3/2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2e^2(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (-2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2)) + (2*e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((2*I)*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^2*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b*e^2
*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
 c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(
3/2)) + ((4*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b^2*e^2*(1 - c^2*x^2)^
(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) - ((2*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])]
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{2\left(e^2-ce^2x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{e^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(e^2-ce^2x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(e^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{(a\cdots}{\sqrt{\cdots}}}{(d+cdx)^{3/2}(e-\cdots}$$

$$= -\frac{e^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \left(\frac{e^2\left(a+b\sin^{-1}(\cdots}{\left(1-c^2x^2\right)^3\cdots}\right.}{(d+cdx)^{3/2}(\cdots}$$

$$= -\frac{e^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2e^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(c\cdots}{\left(1-c^2x^2\right)^{3\cdots}}}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [A]
time = 2.34, size = 547, normalized size = 1.03

$$\frac{-\frac{6a^2\sqrt{d+cdx}\sqrt{e-cex}}{1+cx} + 3a^2\sqrt{d}\sqrt{e}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\left(-1+c^2x^2\right)}\right) - \frac{3ab\sqrt{d+cdx}\sqrt{e-cex}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\left(\text{ArcSin}(cx)(4+\text{ArcSin}(cx))-8\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)+\left((-4+\text{ArcSin}(cx))\text{ArcSin}(cx)-8\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)} + \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\left((-6-6i)\text{ArcSin}(cx)^2\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+i\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-\text{ArcSin}(cx)^3\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)+6\text{ArcSin}(cx)\left(i\pi+4\log\left(1-ie^{i\text{ArcSin}(cx)}\right)\right)\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)+12\pi\left(2\log\left(1+e^{-i\text{ArcSin}(cx)}\right)+\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-2\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)\right)\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-24i\,\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}}{3cd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] ((-6*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1 + c*x) + 3*a^2*Sqrt[d]*Sqrt[e]
*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^
2))] - (3*a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c
*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + (
(-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2])) + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-6 - 6*I)*ArcSin[c*x
]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) - ArcSin[c*x]^3*(Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]) + 6*ArcSin[c*x]*(I*Pi + 4*Log[1 - I*E^(I*Arc
Sin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 12*Pi*(2*Log[1 + E^
((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/
2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]) - (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
])))/(3*c*d^2)
```

Maple [F]
time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-cex+e}}{(cdx+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="maxima")
```

```
[Out] -a^2*(2*sqrt(-c^2*d*x^2*e + d*e)/(c^2*d^2*x + c*d^2) + arcsin(c*x)*e^(1/2)/
(c*d^(3/2))) + sqrt(d)*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*
x + 1)*sqrt(-c*x + 1)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(3/2),x)
```

```
[Out] Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/(d*(c*x + 1))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{e-c\,e\,x}}{(d+c\,d\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(3/2), x)
```

3.545 $\int \frac{\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=486

$$\frac{ie^3(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\text{ArcSin}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^3(1-c^2x^2)^{5/2}\,(a+b\text{ArcSi}}{3c(d+cdx)}$$

```
[Out] 1/3*I*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+
e)^(5/2)-4/3*b^2*e^3*(-c^2*x^2+1)^(5/2)*cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*
x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*
cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*b*e^3*(-
c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)-1/3*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*cot
(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)-4/3*b*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*I*b^2*e^3*(-c^
2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)
```

Rubi [A]
time = 0.77, antiderivative size = 486, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4763, 4859, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\frac{ie^3(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4be^3(1-c^2x^2)^{5/2}\log\left(1-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{e^3(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2be^3(1-c^2x^2)^{5/2}\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{e^3(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{4ib^2e^3(1-c^2x^2)^{5/2}\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] ((I/3)*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - (4*b^2*e^3*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^3*(1 - c^2*x^2)^(5/2)*(a
 + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) - (2*b*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 +
 ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + Arc
Sin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*b^2*e^3*(1 - c^2*x^2)^(5/2)*Poly
Log[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(e-cex)^3(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{2e^3(a+b\sin^{-1}(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}} - \frac{e^3(a+b\sin^{-1}(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{\left(e^3(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\sin^{-1}(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2e^3(1-c^2x^2)^{5/2}\right)\int \frac{\quad}{(1+\ldots}}{(d+cdx)^{5/2}(e-\ldots}$$

$$= -\frac{\left(e^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{c+c\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2ce^3(1-c\ldots\right.}{}$$

$$= -\frac{\left(e^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)dx, x, \sin^{-1}(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}} - \ldots$$

$$= \frac{e^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2be^3(1-c^2\ldots}{}$$

$$= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))\ldots}{3c(d+cdx)^{5/2}(e-\ldots}$$

$$= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin\ldots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/\ldots}}$$

$$= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin\ldots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/\ldots}}$$

$$= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin\ldots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/\ldots}}$$

$$= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\sin\ldots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5/\ldots}}$$

Mathematica [A]
time = 5.77, size = 527, normalized size = 1.08

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((a^2*(-1 + c*x)^2)/(1 + c*x)^2 - (a*b*(Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x]
```

```
 + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4
+ 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 +
 (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[Ar
cSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Cos[ArcSin[c*x]/2
] + Sin[ArcSin[c*x]/2])^4 - (b^2*(-1 + c*x)^2*((-I)*Pi*ArcSin[c*x] + (1 + I
)*ArcSin[c*x]^2 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x
])*Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[S
in[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*Ar
cSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3
 - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2])^2 - (2*(-4 + ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2])^2)))/(3*c*d^3*(-1 + c*x))
```

Maple [**F**]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-cex+e}}{(cdx+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="maxima")
```

```
[Out] -2/3*a*b*c*(2*e^(1/2)/(c^3*d^(5/2)*x + c^2*d^(5/2)) + e^(1/2)*log(c*x + 1)/
(c^2*d^(5/2))) - 2/3*a*b*(2*sqrt(-c^2*d*x^2*e + d*e)/(c^3*d^3*x^2 + 2*c^2*d
^3*x + c*d^3) - sqrt(-c^2*d*x^2*e + d*e)/(c^2*d^3*x + c*d^3))*arcsin(c*x) +
 b^2*e^(1/2)*integrate(sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1))^2/((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)), x)/sqrt(d) - 1/3*a
^2*(2*sqrt(-c^2*d*x^2*e + d*e)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - sqrt(-
c^2*d*x^2*e + d*e)/(c^2*d^3*x + c*d^3))
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))^2\,\sqrt{e - c\,e\,x}}{(d + c\,d\,x)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(5/2), x)
```

3.546 $\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=697

$$\frac{8b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{225c}-\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}+\frac{16b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{75c\,(1-c^2x^2)}-\frac{15b^2dx(d+cd\ldots}{64\,(1\ldots}$$

```
[Out] 8/225*b^2*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c-1/32*b^2*d*x*(c*d*x+d)^(3/2)
*(-c*e*x+e)^(3/2)+16/75*b^2*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c/(-c^2*x^2+
1)-15/64*b^2*d*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/(-c^2*x^2+1)+2/125*b^2*d*
(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)/c+9/64*b^2*d*(c*d*x+d)^(3/2)*
(-c*e*x+e)^(3/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(3/2)+2/5*b*d*x*(c*d*x+d)^(3/2)
*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)-3/8*b*c*d*x^2*(c*d*x
+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)-4/15*b*c^2*
d*x^3*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)
+2/25*b*c^4*d*x^5*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*
x^2+1)^(3/2)+1/4*d*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2+3
/8*d*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(-c^2*x^2+1)-1/
5*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c+1/8
*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(3
/2)+1/8*b*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))*(-c^2*x^2+1)
^(1/2)/c
```

Rubi [A]
time = 0.54, antiderivative size = 697, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.469$, Rules used = {4763, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1261, 712}

$$-\frac{3bcdx^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{8\left(1-c^2x^2\right)^{3/2}}+\frac{3dx(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{8\left(1-c^2x^2\right)}+\frac{2bdx(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{5\left(1-c^2x^2\right)^{3/2}}+\frac{d(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^3}{8bc\left(1-c^2x^2\right)^{3/2}}-\frac{d\left(1-c^2x^2\right)(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{5c}+\frac{bd\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{8c}-\frac{4bc^2dx^3(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{15\left(1-c^2x^2\right)^{3/2}}+\frac{2bc^4dx^5(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{25\left(1-c^2x^2\right)^{3/2}}+\frac{1}{4}dx(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2+\frac{9b^2d\text{ArcSin}(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c\left(1-c^2x^2\right)^{3/2}}-\frac{15b^2dx(cdx+d)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)}+\frac{2b^2d\left(1-c^2x^2\right)(cdx+d)^{3/2}(e-cex)^{3/2}}{125c}+\frac{16b^2d(cdx+d)^{3/2}(e-cex)^{3/2}}{75c\left(1-c^2x^2\right)}-\frac{1}{32}b^2dx(cdx+d)^{3/2}(e-cex)^{3/2}+\frac{8b^2d(cdx+d)^{3/2}(e-cex)^{3/2}}{225c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (8*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*d*x*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2))/32 + (16*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2))/(75*c*(1 - c^2*x^2)) - (15*b^2*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
/(64*(1 - c^2*x^2)) + (2*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^2
*x^2))/(125*c) + (9*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])/
(64*c*(1 - c^2*x^2)^(3/2)) + (2*b*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(
a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*d*x^2*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) - (4*b*c^2
*d*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c^
2*x^2)^(3/2)) + (2*b*c^4*d*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*A
rcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*d*(d + c*d*x)^(3/2)*(e - c*e*x)^
```

```
(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (d*x*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*d*x*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) - (d*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (d*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^(
3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int (d+cdx)\left(1-c^2x^2\right)^{3/2}(a+b}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(d\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(\right.\right.}{\left(1-c^2x^2\right)^{3}}$$

$$= \frac{\left(d(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 - \frac{d(d+c}{}$$

$$= \frac{2bdx(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^2dx^3}{}$$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2} + \frac{2bdx(d+cdx)^{3/2}(e-}{5\,(1-}$$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2dx(d+cdx)^{3/2}(e}{64\left(1-c^2x^2\right.}$$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2dx(d+cdx)^{3/2}(e}{64\left(1-c^2x^2\right.}$$

$$= \frac{8b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{225c} - \frac{1}{32}b^2dx(d+cdx)^{3/2}(e-c$$

Mathematica [A]
time = 2.30, size = 574, normalized size = 0.82

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*e*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a^
2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*ArcSin[c*x]^2*(-10*b*Cos[3*ArcSin[c*x]] - 2*b*Cos[5*ArcSin[c*x]] + 5*
(12*a - 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x
]])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]] + 4000
```

```
*b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] + 288*b^2*Cos[5*ArcSi
n[c*x]] - 15*(-4800*b^2*Sqrt[1 - c^2*x^2] - 512*a*b*c*x*(15 - 10*c^2*x^2 +
3*c^4*x^4) + 480*a^2*Sqrt[1 - c^2*x^2]*(8 - 25*c*x - 16*c^2*x^2 + 10*c^3*x^
3 + 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSin[c*x]]))
- 60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(-1200*b*Cos[2*ArcSin[c*
x]] - 75*b*Cos[4*ArcSin[c*x]] - 4*(300*b*c*x - 480*a*Sqrt[1 - c^2*x^2] + 96
0*a*c^2*x^2*Sqrt[1 - c^2*x^2] - 480*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 600*a*Sin
[2*ArcSin[c*x]] + 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin[c*x]] + 6*b*S
in[5*ArcSin[c*x]]))))/(288000*c*Sqrt[1 - c^2*x^2])
```

Maple [**F**]
time = 0.15, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{5}{2}} (-cex+e)^{\frac{3}{2}} (a+b\arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/40*(15*sqrt(-c^2*d*x^2*e + d*e)*d^2*x*e + 10*(-c^2*d*x^2*e + d*e)^(3/2)*d
*x + 15*d^(5/2)*arcsin(c*x)*e^(3/2)/c - 8*(-c^2*d*x^2*e + d*e)^(5/2)*e^(-1)
/c)*a^2 + sqrt(d)*e^(1/2)*integrate(-((b^2*c^3*d^2*x^3*e + b^2*c^2*d^2*x^2*
e - b^2*c*d^2*x*e - b^2*d^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
 + 2*(a*b*c^3*d^2*x^3*e + a*b*c^2*d^2*x^2*e - a*b*c*d^2*x*e - a*b*d^2*e)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-((b^2*c^3*d^2*x^3 + b^2*c^2*d^2*x^2 - b^2*c*d^2*x - b^2*d^2)*arcs
in(c*x)^2*e + 2*(a*b*c^3*d^2*x^3 + a*b*c^2*d^2*x^2 - a*b*c*d^2*x - a*b*d^2)
*arcsin(c*x)*e + (a^2*c^3*d^2*x^3 + a^2*c^2*d^2*x^2 - a^2*c*d^2*x - a^2*d^2
)*e)*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\right)}^{5/2}\,{\left(e-c\,e\,x\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2), x)
```

3.547 $\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=362

$$-\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)}+\frac{9b^2(d+cdx)^{3/2}(e-cex)^{3/2}\text{ArcSin}(cx)}{64c\left(1-c^2x^2\right)^{3/2}}-\frac{3b}{}$$

```
[Out] -1/32*b^2*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)-15/64*b^2*x*(c*d*x+d)^(3/2)*(-
c*e*x+e)^(3/2)/(-c^2*x^2+1)+9/64*b^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*arcsi
n(c*x)/c/(-c^2*x^2+1)^(3/2)-3/8*b*c*x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a
+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)+1/4*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(
a+b*arcsin(c*x))^2+3/8*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))
^2/(-c^2*x^2+1)+1/8*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/
c/(-c^2*x^2+1)^(3/2)+1/8*b*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x
))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.30, antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.281$, Rules used = {4763, 4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^3}{8bc\left(1-c^2x^2\right)^{3/2}}+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{8\left(1-c^2x^2\right)}+\frac{b\sqrt{1-c^2x^2}\,(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{8c}-\frac{3bcx^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{8\left(1-c^2x^2\right)^{3/2}}+\frac{1}{4}x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2+\frac{9b^2\text{ArcSin}(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c\left(1-c^2x^2\right)^{3/2}}-\frac{15b^2x(cdx+d)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)}-\frac{1}{32}b^2x(cdx+d)^{3/2}(e-cex)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/32*(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (15*b^2*x*(d + c*d*x)^(
3/2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (
b*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 +
 (3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^
2*x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*
c*(1 - c^2*x^2)^(3/2))
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{(3(d+}{}$$

$$= \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c} +$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{3bcx^2(d+cdx)^{3/2}(e}{8\,(1}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e}{64\left(1-c^2x^2\right.}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e}{64\left(1-c^2x^2\right.}$$

Mathematica [A]
time = 1.14, size = 373, normalized size = 1.03

$$\frac{32b^2de\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3 - 96a^2d^{3/2}e^{3/2}\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right) + 8bde\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2(12a+8b\sin(2\mathrm{ArcSin}(cx))+b\sin(4\mathrm{ArcSin}(cx))) + de\sqrt{d+cdx}\,\sqrt{e-cex}\left(160a^2cx\sqrt{1-c^2x^2} - 64a^2c^3x^3\sqrt{1-c^2x^2} + 64ab\cos(2\mathrm{ArcSin}(cx)) + 4ab\cos(4\mathrm{ArcSin}(cx)) - 32b^2\sin(2\mathrm{ArcSin}(cx)) - b^2\sin(4\mathrm{ArcSin}(cx))\right) + 4bde\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)(16b\cos(2\mathrm{ArcSin}(cx)) + b\cos(4\mathrm{ArcSin}(cx)) + 4a(8\sin(2\mathrm{ArcSin}(cx)) + \sin(4\mathrm{ArcSin}(cx))))}{256c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*
e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqr
```

```
t[d]*Sqrt[e]*(-1 + c^2*x^2))] + 8*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Arc
Sin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]]) + d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c^3*x^
3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c*x]]
- 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[
c*x]] + 4*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c
^2*x^2])
```

Maple [**F**]
time = 0.15, size = 0, normalized size = 0.00

$$\int \left(c d x+d\right)^{\frac{3}{2}} \left(-c e x+e\right)^{\frac{3}{2}} \left(a+b \arcsin \left(c x\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/8*(3*sqrt(-c^2*d*x^2*e + d*e)*d*x*e + 2*(-c^2*d*x^2*e + d*e)^(3/2)*x + 3*
d^(3/2)*arcsin(c*x)*e^(3/2)/c)*a^2 + sqrt(d)*e^(1/2)*integrate(-((b^2*c^2*d
*x^2*e - b^2*d*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2
*d*x^2*e - a*b*d*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x +
1)*sqrt(-c*x + 1), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-((b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2*e + 2*(a*b*c^2*d*x^2 - a*b
*d)*arcsin(c*x)*e + (a^2*c^2*d*x^2 - a^2*d)*e)*sqrt(c*d*x + d)*sqrt(-(c*x -
 1)*e), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4368 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.548 $\int \sqrt{d+cdx}\,(e-cex)^{3/2}(a+b\textbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=455

$$-\frac{4b^2e\sqrt{d+cdx}\,\sqrt{e-cex}}{9c}-\frac{1}{4}b^2ex\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{2b^2e\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)}{27c}+\frac{b^2e\sqrt{d+cd}}{4}$$

```
[Out] -4/9*b^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-1/4*b^2*e*x*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)-2/27*b^2*e*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+
1/2*e*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/3*e*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+1/4*b^2*e*arcsi
n(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/3*b*e*x*(a+b
*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*b*c*e
*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+
2/9*b*c^2*e*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^
2+1)^(1/2)+1/6*e*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c/(
-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.41, antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45}

$$-\frac{bcex^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}-\frac{2bex\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{e\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{e(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{3c}+\frac{2bc^2ex^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}+\frac{1}{2}ex\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2+\frac{b^2e\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}}-\frac{2b^2e(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}}{27c}-\frac{1}{4}b^2ex\sqrt{cdx+d}\,\sqrt{e-cex}-\frac{4b^2e\sqrt{cdx+d}\,\sqrt{e-cex}}{9c}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*e*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/4 - (2*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
))/(27*c) + (b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
 - c^2*x^2]) - (2*b*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
)/(3*Sqrt[1 - c^2*x^2]) - (b*c*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b
*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (2*b*c^2*e*x^3*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (e*x*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
```

```
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \sqrt{d+cdx}\,(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int (e-cex)\sqrt{1-c^2x^2}\,(a+b\sin^{-1}}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \left(e\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(e\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}ex\sqrt{d+cdx}\,\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{e\sqrt{d+cd}}{}$$

$$= -\frac{2bex\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))}{3\sqrt{1-c^2x^2}} - \frac{bcex^2\sqrt{d}}{}$$

$$= -\frac{1}{4}b^2ex\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{2bex\sqrt{d+cdx}\,\sqrt{e-ce}}{3\sqrt{1-c^2}}$$

$$= -\frac{1}{4}b^2ex\sqrt{d+cdx}\,\sqrt{e-cex} + \frac{b^2e\sqrt{d+cdx}\,\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}}$$

$$= -\frac{4b^2e\sqrt{d+cdx}\,\sqrt{e-cex}}{9c} - \frac{1}{4}b^2ex\sqrt{d+cdx}\,\sqrt{e-ce}$$

Mathematica [A]
time = 1.10, size = 440, normalized size = 0.97

$$\frac{36b^2e\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^3 - 108a^2\sqrt{d}\,e^{3/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right) + 18be\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^2\left(6a+3b\sqrt{1-c^2x^2}+b\cos(3\text{ArcSin}(cx))+3b\sin(2\text{ArcSin}(cx))\right) + e\sqrt{d+cdx}\,\sqrt{e-cex}\left(54ab\cos(2\text{ArcSin}(cx)) - 4b^2\cos(3\text{ArcSin}(cx)) - 3\left(4\left(9b^2\sqrt{1-c^2x^2} - 4abcx(-3+c^2x^2) + 3a^2\sqrt{1-c^2x^2}\,(-2-3cx+2c^2x^2)\right) + 9b^2\sin(2\text{ArcSin}(cx))\right)\right) - 6be\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)\left(-9b\cos(2\text{ArcSin}(cx)) + 2\left(9bcx - 12a\sqrt{1-c^2x^2} + 12ac^2x^2\sqrt{1-c^2x^2} - 9a\sin(2\text{ArcSin}(cx)) + b\sin(3\text{ArcSin}(cx))\right)\right)}{216c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (36*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*Sqrt[d]*e
^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt
[d]*Sqrt[e]*(-1 + c^2*x^2))] + 18*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSi
n[c*x]^2*(6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] + 3*b*Sin[2*Ar
cSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(54*a*b*Cos[2*ArcSin[c*x]]
 - 4*b^2*Cos[3*ArcSin[c*x]] - 3*(4*(9*b^2*Sqrt[1 - c^2*x^2] - 4*a*b*c*x*(-3
 + c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 - 3*c*x + 2*c^2*x^2)) + 9*b^2*Sin[
2*ArcSin[c*x]])) - 6*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(-9*b*
Cos[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^2*x^2*Sqr
```

```
t[1 - c^2*x^2] - 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))/(216*c*Sq
rt[1 - c^2*x^2])
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \sqrt{cdx+d}\,(-cex+e)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/6*(3*sqrt(-c^2*d*x^2*e + d*e)*x*e + 3*sqrt(d)*arcsin(c*x)*e^(3/2)/c + 2*(
-c^2*d*x^2*e + d*e)^(3/2)/(c*d))*a^2 + sqrt(d)*e^(1/2)*integrate(-((b^2*c*x
*e - b^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c*x*e - a
*b*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-((b^2*c*x - b^2)*arcsin(c*x)^2*e + 2*(a*b*c*x - a*b)*arcsin(c*x)*
e + (a^2*c*x - a^2)*e)*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d(cx+1)}\,(-e(cx-1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\left(e-c\,e\,x\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(3/2), x)
```

3.549 $\int \frac{(e-cex)^{3/2}(a+b\textbf{ArcSin}(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=398

$$-\frac{4b^2e^2(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{b^2e^2x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{b^2e^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{4be^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSi}}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

```
[Out] -4*b^2*e^2*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/4*b^2*e^2*x*(-
c^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*e^2*(-c^2*x^2+1)*(a+b*arcsin(
c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/2*e^2*x*(-c^2*x^2+1)*(a+b*arcs
in(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/4*b^2*e^2*arcsin(c*x)*(-c^2*x
^2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*b*e^2*x*(a+b*arcsin(c*x))*
(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*b*c*e^2*x^2*(a+b*ar
csin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*e^2*(a+b
*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.40, antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.281$, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8}

$$\frac{e^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{2bc\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2e^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{e^2x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{2\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{bce^2x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{4be^2x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{b^2e^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{4b^2e^2(1-c^2x^2)}{c\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{b^2e^2x(1-c^2x^2)}{4\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (-4*b^2*e^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*e^2*x
*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*e^2*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (4*b*e^2*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*
e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]) - (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]) + (e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*
c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
```

```
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int (a+bx)^2(ce-ce\sin(x))^2\,dx,x,\sin^{-1}(cx)\right)}{c^3\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int \left(c^2e^2(a+bx)^2-2c^2e^2(a+bx)^2\sin(x)+c^2e^2(a+\right.\right.}{c^3\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{e^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\left(e^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (a+bx)^2\right.}{c\sqrt{d+cdx}\,\sqrt{e-}}$$

$$= \frac{bce^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2e^2(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{c\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{b^2e^2x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{4be^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{bce^2x^2}{}$$

$$= -\frac{4b^2e^2(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{b^2e^2x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{b^2e^2\sqrt{1-c^2x^2}}{4c\sqrt{d+cdx}\,\sqrt{}}$$

Mathematica [A]
time = 1.28, size = 358, normalized size = 0.90

$$\frac{4b^2e\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-12a^2\sqrt{d}\,e^{3/2}\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)-2be\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)\left(16bcx+4a(-4+cx)\sqrt{1-c^2x^2}+b\cos(2\mathrm{ArcSin}(cx))\right)+2be\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2\left(6a+8b\sqrt{1-c^2x^2}-b\sin(2\mathrm{ArcSin}(cx))\right)+e\sqrt{d+cdx}\,\sqrt{e-cex}\left(-4\left(8abcx+8b^2\sqrt{1-c^2x^2}+a^2(-4+cx)\sqrt{1-c^2x^2}\right)-2ab\cos(2\mathrm{ArcSin}(cx))+b^2\sin(2\mathrm{ArcSin}(cx))\right)}{8cd\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*e^(
3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d
]*Sqrt[e]*(-1 + c^2*x^2))] - 2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c
*x]*(16*b*c*x + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]) +
2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(6*a + 8*b*Sqrt[1 - c^2
*x^2] - b*Sin[2*ArcSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4*(8*a*
b*c*x + 8*b^2*Sqrt[1 - c^2*x^2] + a^2*(-4 + c*x)*Sqrt[1 - c^2*x^2]) - 2*a*b
*Cos[2*ArcSin[c*x]] + b^2*Sin[2*ArcSin[c*x]]))/(8*c*d*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(-cex+e)^{\frac{3}{2}} (a+b\arcsin(cx))^2}{\sqrt{cdx+d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="maxima")
[Out] -1/2*(sqrt(-c^2*d*x^2*e + d*e)*x*e/d - 3*arcsin(c*x)*e^(3/2)/(c*sqrt(d)) -
4*sqrt(-c^2*d*x^2*e + d*e)*e/(c*d))*a^2 - sqrt(d)*e^(1/2)*integrate(((b^2*c
*x*e - b^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c*x*e -
 a*b*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x
 + 1)/(c*d*x + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="fricas")
[Out] integral(-((b^2*c*x - b^2)*arcsin(c*x)^2*e + 2*(a*b*c*x - a*b)*arcsin(c*x)*
e + (a^2*c*x - a^2)*e)*sqrt(-(c*x - 1)*e)/sqrt(c*d*x + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(-e(cx-1))^{\frac{3}{2}} (a+b\,\mathrm{asin}(cx))^2}{\sqrt{d(cx+1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

```
[Out] Integral((-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2/sqrt(d*(c*x + 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{\sqrt{d+c\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(1/2), x)
```

3.550 $\int \frac{(e-cex)^{3/2}(a+b\textbf{ArcSin}(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=714

$$\frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2b^2e^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2b^2e^3x(1-c^2x^2)^{3/2}\,\text{ArcSin}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{4e^3(1-c^2x^2)\,(a+b}{c(d+cdx)^{3/2}(e}$$

```
[Out] 2*a*b*e^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b^2*e^3*(
-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b^2*e^3*x*(-c^2*x^2+1)^(
3/2)*arcsin(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*e^3*(-c^2*x^2+1)*(a+b*a
rcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*e^3*x*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*e^3*(-c^2*x^2+1)^(3/2)*
(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-e^3*(-c^2*x^2+1)^2*(
a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-e^3*(-c^2*x^2+1)^(3/2
)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-16*I*b*e^3*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d
)^(3/2)/(-c*e*x+e)^(3/2)+8*b*e^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*I*b^2*e^
3*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(
3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*e^3*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b^2*e^3*(-c^2*x^2+
1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x
+e)^(3/2)
```

Rubi [A]
time = 0.76, antiderivative size = 714, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.469$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267}

$$-\frac{16ibe^3(1-c^2x^2)^{3/2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{e^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^3}{bc(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{e^3(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ie^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4e^3x(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4e^3(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{8be^3(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2abe^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{8ib^2e^3(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{8ib^2e^3(1-c^2x^2)^{3/2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2e^3(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b^2e^3x(1-c^2x^2)^{3/2}\,\text{ArcSin}(cx)}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b^2e^3(1-c^2x^2)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (2*a*b*e^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b^2*e^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (2*b^2
*e^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (4*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)) + (4*e^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^
(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x
])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^
2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
```

```
((16*I)*b*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*e^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) + ((8*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^
(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*e^3*
(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) - ((4*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)
*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{4\left(e^3-ce^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{3e^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{ce^3x(a+b}{\sqrt{1-}}\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(e^3-ce^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(3e^3\left(1-c^2x^2\right)^{3/2}\right)\int}{(d+cdx)^{3/2}(e}$$

$$= -\frac{e^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right.}{bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1}{bc}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-}{c(d}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-}{(d+cdx}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-}{(d+cdx}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-}{(d+cdx}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-}{(d+cdx}$$

$$= \frac{2abe^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-}{(d+cdx}$$

Mathematica [A]
time = 4.78, size = 1086, normalized size = 1.52

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (-3*a^2*e*(5 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 9*a^2*Sqrt[d]*e^(3/2)*(1 + c*x)*Sqrt
[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]
*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 3*a*b*e*(1 +
c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*(4 +
ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4 + Arc
Sin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin
[ArcSin[c*x]/2]) - b^2*e*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((6 + 6*
I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) + ArcSin[c*x]^
3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - (4*I)
*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) -
12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*L
og[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])) - 6*a*b*e*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x
 + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2]
 + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b^2*e*(1 + c*x)*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - I*c*x - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*(Sqrt[1 - c^2*x^2] + 4*Pi*
Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 4*Pi*Lo
g[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*ArcSin[c*x]^2*(((2 + 2*I) + Sqrt[
1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + ((-2 + 2*I) + Sqrt[1 - c^2*x^2])*Sin[Arc
Sin[c*x]/2])))/(3*c*d^2*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2]))
```

Maple [F]
time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{(-cex+e)^{\frac{3}{2}} (a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="maxima")
```

```
[Out] a^2*((-c^2*d*x^2*e + d*e)^(3/2)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - 6*sqr
t(-c^2*d*x^2*e + d*e)*e/(c^2*d^2*x + c*d^2) - 3*arcsin(c*x)*e^(3/2)/(c*d^(3
/2))) - sqrt(d)*e^(1/2)*integrate(((b^2*c*x*e - b^2*e)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c*x*e - a*b*e)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d^2*x^2 + 2*c*d^2*x + d
^2), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral(-((b^2*c*x - b^2)*arcsin(c*x)^2*e + 2*(a*b*c*x - a*b)*arcsin(c*x)*
e + (a^2*c*x - a^2)*e)*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)/(c^2*d^2*x^2 + 2*
c*d^2*x + d^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{(d+c\,d\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(3/2),x)
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(3/2), x)
```

3.551 $\int \frac{(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal. Leaf size=544

$$\frac{8ie^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\text{Ar}\right.}{3c(d+cdx)^{5/2}(e-cex)^{5}}$$

```
[Out] 8/3*I*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+
e)^(5/2)+1/3*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2)
/(-c*e*x+e)^(5/2)-8/3*b^2*e^4*(-c^2*x^2+1)^(5/2)*cot(1/4*Pi+1/2*arcsin(c*x)
)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+8/3*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin
(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-4/3
*b*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c
/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*
x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)
^(5/2)/(-c*e*x+e)^(5/2)-32/3*b*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(
1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+32/3*I*b
^2*e^4*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+
d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A]
time = 0.79, antiderivative size = 544, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4859, 4737, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\frac{e^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{8ie^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{32be^4(1-c^2x^2)^{5/2}\log\left(1-ie^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{8e^4(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4be^4(1-c^2x^2)^{5/2}\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{32ib^2e^4(1-c^2x^2)^{5/2}\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (((8*I)/3)*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(3
*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b^2*e^4*(1 - c^2*x^2)^(5/2)*
Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*e
^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^4*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e
*x)^(5/2)) - (2*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + Ar
cSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (32*b*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I
*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((32*I)/3)*b^2
*e^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(e-cex)^4\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{e^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{4e^4\left(a+b\sin^{-1}(cx)\right)^2}{(1+cx)^2\sqrt{1-c^2x^2}} - \frac{4e^4\left(a+b\sin^{-1}(cx\right.}{(1+cx)\sqrt{1-c^2}}\right.}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e^4(1-c^2x^2)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4e^4(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\sin}{(1+cx)^2\sqrt{}}}{(d+cdx)^{5/2}(e-cex}$$

$$= \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(a+}{c+c\,s}\right.}{(d+cdx)^{5/2}(e-}$$

$$= \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+b\right.}{c(d+cdx)^{5/}}$$

$$= \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right.}{c(d+cdx)^{5/2}(e-}$$

$$= \frac{4ie^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx\right.}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{8ie^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx\right.}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{8ie^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx\right.}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{8ie^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx\right.}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{8ie^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx\right.}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1438 vs. 2(544) = 1088.
time = 8.26, size = 1438, normalized size = 2.64

Too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((-4*a^2*e)/(3*d^3*(1 + c*x)^2) +
(8*a^2*e)/(3*d^3*(1 + c*x))))/c - (a^2*e^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 + c
*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*d^(5/2
)) - (a*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[c*
x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + C
os[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4*ArcSin[c*x] + 6*ArcSin[c*x]^2 +
 Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*ArcSin[c*x]) - 28*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]])*Sin[ArcSin[c*x]/2]))/(6*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)
]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (a*b*e*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^
2]*ArcSin[c*x] - 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sqrt[1
- c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]
))/(3*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2])^4) - (b^2*e*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
*Sqrt[-(d*e*(1 - c^2*x^2))]*((-I)*Pi*ArcSin[c*x] + (1 + I)*ArcSin[c*x]^2 -
4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*
ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi + 2*ArcSin[
c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^2*Sin[Ar
cSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 - (2*ArcSin[c*x]*
(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (2*(-4 + A
rcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])
))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2])^2) + (b^2*e*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((7*I)*Pi*ArcSin[c*x] - (7 + 7*I)*ArcSin
[c*x]^2 - ArcSin[c*x]^3 + 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi + 2*
ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 28*Pi*Log[Cos[ArcSin[c*x]/2]] -
 14*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (28*I)*PolyLog[2, I*E^(I*ArcSin[c
*x])] - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcS
in[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2])^2 + (2*(-4 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]
*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2)
```

Maple [F]

time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(-cex+e)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="maxima")
```

```
[Out] -1/3*a^2*((-c^2*d*x^2*e + d*e)^(3/2)/(c^4*d^4*x^3 + 3*c^3*d^4*x^2 + 3*c^2*d
^4*x + c*d^4) + 2*sqrt(-c^2*d*x^2*e + d*e)*e/(c^3*d^3*x^2 + 2*c^2*d^3*x + c
*d^3) - 7*sqrt(-c^2*d*x^2*e + d*e)*e/(c^2*d^3*x + c*d^3) - 3*arcsin(c*x)*e^
(3/2)/(c*d^(5/2))) - sqrt(d)*e^(1/2)*integrate(((b^2*c*x*e - b^2*e)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c*x*e - a*b*e)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^3*d^3*x^3 +
3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-((b^2*c*x - b^2)*arcsin(c*x)^2*e + 2*(a*b*c*x - a*b)*arcsin(c*x)*
e + (a^2*c*x - a^2)*e)*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)/(c^3*d^3*x^3 + 3*
c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{(d+c\,d\,x)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(5/2), x)
```

3.552 $\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=502

$$-\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2}-\frac{245b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1152\,(1-c^2x^2)^2}-\frac{65b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1728\,(1-c^2x^2)}+\frac{115b^2(d+$$

```
[Out] -1/108*b^2*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)-245/1152*b^2*x*(c*d*x+d)^(5/2
)*(-c*e*x+e)^(5/2)/(-c^2*x^2+1)^2-65/1728*b^2*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^
(5/2)/(-c^2*x^2+1)+115/1152*b^2*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*arcsin(c*x
)/c/(-c^2*x^2+1)^(5/2)-5/16*b*c*x^2*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*a
rcsin(c*x))/(-c^2*x^2+1)^(5/2)+1/6*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*
arcsin(c*x))^2+5/16*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/
(-c^2*x^2+1)^2+5/24*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/
(-c^2*x^2+1)+5/48*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^3/b/c/
(-c^2*x^2+1)^(5/2)+5/48*b*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x)
)/c/(-c^2*x^2+1)^(1/2)+1/18*b*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.37, antiderivative size = 502, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.281$, Rules used = {4763, 4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\frac{5(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^3}{48bc\,(1-c^2x^2)^{5/2}}+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2}{24\,(1-c^2x^2)}+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2}{16\,(1-c^2x^2)^2}+\frac{b\sqrt{1-c^2x^2}\,(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))}{18c}+\frac{5b(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))}{48c\sqrt{1-c^2x^2}}-\frac{5bcx^2(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))}{16\,(1-c^2x^2)^{5/2}}+\frac{1}{6}x(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\text{ArcSin}(cx))^2+\frac{115b^2\text{ArcSin}(cx)(cdx+d)^{5/2}(e-cex)^{5/2}}{1152c\,(1-c^2x^2)^{5/2}}-\frac{65b^2x(cdx+d)^{5/2}(e-cex)^{5/2}}{1728\,(1-c^2x^2)}-\frac{245b^2x(cdx+d)^{5/2}(e-cex)^{5/2}}{1152\,(1-c^2x^2)^2}-\frac{1}{108}b^2x(cdx+d)^{5/2}(e-cex)^{5/2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/108*(b^2*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (245*b^2*x*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2))/(1152*(1 - c^2*x^2)^2) - (65*b^2*x*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2))/(1728*(1 - c^2*x^2)) + (115*b^2*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)*ArcSin[c*x])/(1152*c*(1 - c^2*x^2)^(5/2)) - (5*b*c*x^2*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^(5/2
)) + (5*b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(48*c*Sq
rt[1 - c^2*x^2]) + (b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/(18*c) + (x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a +
b*ArcSin[c*x])^2)/6 + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSi
n[c*x])^2)/(16*(1 - c^2*x^2)^2) + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*
(a + b*ArcSin[c*x])^2)/(24*(1 - c^2*x^2)) + (5*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)*(a + b*ArcSin[c*x])^3)/(48*b*c*(1 - c^2*x^2)^(5/2))
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
```

```
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{5/2}(e-cex)^{5/2}\right)\int\left(1-c^2x^2\right)^{5/2}\left(a+b\sin^{-1}(cx\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2+\frac{(5(d+c}{}$$

$$= \frac{b(d+cdx)^{5/2}(e-cex)^{5/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{18c}+$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2}+\frac{5b(d+cdx)^{5/2}(e-c}{48c\sqrt{1}}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2}-\frac{65b^2x(d+cdx)^{5/2}(e}{1728\left(1-c^2x\right.}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2}-\frac{245b^2x(d+cdx)^{5/2}(e}{1152\left(1-c^2x\right.}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2}-\frac{245b^2x(d+cdx)^{5/2}(e}{1152\left(1-c^2x\right.}$$

Mathematica [A]

time = 1.70, size = 450, normalized size = 0.90

$$\frac{d^2e^2\left(1440b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-4320a^2\sqrt{d}\,\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)+12b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)(270b\cos(2\mathrm{ArcSin}(cx))+27b\cos(4\mathrm{ArcSin}(cx))+2b\cos(6\mathrm{ArcSin}(cx))+540a\sin(2\mathrm{ArcSin}(cx))+108a\sin(4\mathrm{ArcSin}(cx))+12a\sin(6\mathrm{ArcSin}(cx)))+72b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2(60a+45b\sin(2\mathrm{ArcSin}(cx))+9b\sin(4\mathrm{ArcSin}(cx))+b\sin(6\mathrm{ArcSin}(cx)))+\sqrt{d+cdx}\,\sqrt{e-cex}\left(9504a^2cx\sqrt{1-c^2x^2}-7488a^2c^3x^3\sqrt{1-c^2x^2}+2304a^2c^5x^5\sqrt{1-c^2x^2}+3240ab\cos(2\mathrm{ArcSin}(cx))+324ab\cos(4\mathrm{ArcSin}(cx))+24ab\cos(6\mathrm{ArcSin}(cx))-1620b^2\sin(2\mathrm{ArcSin}(cx))-81b^2\sin(4\mathrm{ArcSin}(cx))-4b^2\sin(6\mathrm{ArcSin}(cx))\right)\right)}{13824c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*e^2*(1440*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2
*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x]*(270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] + 2*b*Co
s[6*ArcSin[c*x]] + 540*a*Sin[2*ArcSin[c*x]] + 108*a*Sin[4*ArcSin[c*x]] + 12
*a*Sin[6*ArcSin[c*x]]) + 72*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2
*(60*a + 45*b*Sin[2*ArcSin[c*x]] + 9*b*Sin[4*ArcSin[c*x]] + b*Sin[6*ArcSin[
c*x]]) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(9504*a^2*c*x*Sqrt[1 - c^2*x^2] -
7488*a^2*c^3*x^3*Sqrt[1 - c^2*x^2] + 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] + 3
240*a*b*Cos[2*ArcSin[c*x]] + 324*a*b*Cos[4*ArcSin[c*x]] + 24*a*b*Cos[6*ArcS
in[c*x]] - 1620*b^2*Sin[2*ArcSin[c*x]] - 81*b^2*Sin[4*ArcSin[c*x]] - 4*b^2*
Sin[6*ArcSin[c*x]])))/(13824*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{5}{2}} (-cex+e)^{\frac{5}{2}} (a+b\arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/48*(15*sqrt(-c^2*d*x^2*e + d*e)*d^2*x*e^2 + 10*(-c^2*d*x^2*e + d*e)^(3/2)
*d*x*e + 8*(-c^2*d*x^2*e + d*e)^(5/2)*x + 15*d^(5/2)*arcsin(c*x)*e^(5/2)/c)
*a^2 + sqrt(d)*e^(1/2)*integrate(((b^2*c^4*d^2*x^4*e^2 - 2*b^2*c^2*d^2*x^2*
e^2 + b^2*d^2*e^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^
4*d^2*x^4*e^2 - 2*a*b*c^2*d^2*x^2*e^2 + a*b*d^2*e^2)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(((b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2*e^2
 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arcsin(c*x)*e^2 + (a^2
*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2)*e^2)*sqrt(c*d*x + d)*sqrt(-(c*x
 - 1)*e), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{asin}(c\,x))^2\,(d + c\,d\,x)^{5/2}\,(e - c\,e\,x)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2), x)
```

3.553 $\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=697

$$-\frac{8b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{225c}-\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{16b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{75c\,(1-c^2x^2)}-\frac{15b^2ex(d+}{64}$$

```
[Out] -8/225*b^2*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c-1/32*b^2*e*x*(c*d*x+d)^(3/2
)*(-c*e*x+e)^(3/2)-16/75*b^2*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c/(-c^2*x^2
+1)-15/64*b^2*e*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/(-c^2*x^2+1)-2/125*b^2*e
*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)/c+9/64*b^2*e*(c*d*x+d)^(3/2)
*(-c*e*x+e)^(3/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(3/2)-2/5*b*e*x*(c*d*x+d)^(3/2
)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)-3/8*b*c*e*x^2*(c*d*
x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)+4/15*b*c^2
*e*x^3*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2
)-2/25*b*c^4*e*x^5*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2
*x^2+1)^(3/2)+1/4*e*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2+
3/8*e*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(-c^2*x^2+1)+1
/5*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c+1/
8*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(
3/2)+1/8*b*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))*(-c^2*x^2+1
)^(1/2)/c
```

Rubi [A]

time = 0.53, antiderivative size = 697, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.469$, Rules used = {4763, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1261, 712}

$$-\frac{3bcex^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{8\left(1-c^2x^2\right)^{3/2}}+\frac{3ex(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{8\left(1-c^2x^2\right)}-\frac{2bex(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{5\left(1-c^2x^2\right)^{3/2}}+\frac{e(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^3}{8bc\left(1-c^2x^2\right)^{3/2}}+\frac{e\left(1-c^2x^2\right)(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{5c}+\frac{be\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{8c}+\frac{4bc^2ex^3(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{15\left(1-c^2x^2\right)^{3/2}}-\frac{2bc^4ex^5(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))}{25\left(1-c^2x^2\right)^{3/2}}+\frac{1}{4}ex(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2+\frac{9b^2e\text{ArcSin}(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c\left(1-c^2x^2\right)^{3/2}}-\frac{15b^2ex(cdx+d)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)}-\frac{2b^2e\left(1-c^2x^2\right)(cdx+d)^{3/2}(e-cex)^{3/2}}{125c}-\frac{16b^2e(cdx+d)^{3/2}(e-cex)^{3/2}}{75c\left(1-c^2x^2\right)}-\frac{1}{32}b^2ex(cdx+d)^{3/2}(e-cex)^{3/2}-\frac{8b^2e(cdx+d)^{3/2}(e-cex)^{3/2}}{225c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-8*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*e*x*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2))/32 - (16*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2))/(75*c*(1 - c^2*x^2)) - (15*b^2*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)
)/(64*(1 - c^2*x^2)) - (2*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^
2*x^2))/(125*c) + (9*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])
/(64*c*(1 - c^2*x^2)^(3/2)) - (2*b*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*
(a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*e*x^2*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (4*b*c^
2*e*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c
^2*x^2)^(3/2)) - (2*b*c^4*e*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*
ArcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*e*(d + c*d*x)^(3/2)*(e - c*e*x)
```

```
^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (e*x*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*e*x*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) + (e*(d + c*d*x)^(3
/2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (e*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^
(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int (e-cex)\left(1-c^2x^2\right)^{3/2}(a+}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(e(1-c^2x^2)^{3/2}(a+b\sin^{-}\right.}{(1-c^2x^2)}$$

$$= \frac{\left(e(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\sin^{-1}(}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}ex(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{e(d+}{}$$

$$= -\frac{2bex(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{5\left(1-c^2x^2\right)^{3/2}} + \frac{4bc^2}{}$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{2bex(d+cdx)^{3/2}(e}{5(1}$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2ex(d+cdx)^{3/2}(}{64\left(1-c^2\right.}$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2ex(d+cdx)^{3/2}(}{64\left(1-c^2\right.}$$

$$= -\frac{8b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{225c} - \frac{1}{32}b^2ex(d+cdx)^{3/2}(e$$

Mathematica [A]
time = 2.32, size = 574, normalized size = 0.82

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*e^2*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a^
2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*ArcSin[c*x]^2*(10*b*Cos[3*ArcSin[c*x]] + 2*b*Cos[5*ArcSin[c*x]] + 5*(
12*a + 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]
])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]] - 4000*
```

```
b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Cos[5*ArcSin
[c*x]] - 15*(4800*b^2*Sqrt[1 - c^2*x^2] + 512*a*b*c*x*(15 - 10*c^2*x^2 + 3*
c^4*x^4) - 480*a^2*Sqrt[1 - c^2*x^2]*(8 + 25*c*x - 16*c^2*x^2 - 10*c^3*x^3
+ 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSin[c*x]])) +
60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(1200*b*Cos[2*ArcSin[c*x]]
 + 75*b*Cos[4*ArcSin[c*x]] + 4*(-300*b*c*x + 480*a*Sqrt[1 - c^2*x^2] - 960*
a*c^2*x^2*Sqrt[1 - c^2*x^2] + 480*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 600*a*Sin[2
*ArcSin[c*x]] - 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin[c*x]] - 6*b*Sin
[5*ArcSin[c*x]]))))/(288000*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int (cdx + d)^{\frac{3}{2}} (-cex + e)^{\frac{5}{2}} (a + b \arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/40*(15*sqrt(-c^2*d*x^2*e + d*e)*d*x*e^2 + 10*(-c^2*d*x^2*e + d*e)^(3/2)*x
*e + 15*d^(3/2)*arcsin(c*x)*e^(5/2)/c + 8*(-c^2*d*x^2*e + d*e)^(5/2)/(c*d))
*a^2 + sqrt(d)*e^(1/2)*integrate(((b^2*c^3*d*x^3*e^2 - b^2*c^2*d*x^2*e^2 -
b^2*c*d*x*e^2 + b^2*d*e^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2
*(a*b*c^3*d*x^3*e^2 - a*b*c^2*d*x^2*e^2 - a*b*c*d*x*e^2 + a*b*d*e^2)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(((b^2*c^3*d*x^3 - b^2*c^2*d*x^2 - b^2*c*d*x + b^2*d)*arcsin(c*x)^2
*e^2 + 2*(a*b*c^3*d*x^3 - a*b*c^2*d*x^2 - a*b*c*d*x + a*b*d)*arcsin(c*x)*e^
2 + (a^2*c^3*d*x^3 - a^2*c^2*d*x^2 - a^2*c*d*x + a^2*d)*e^2)*sqrt(c*d*x + d
)*sqrt(-(c*x - 1)*e), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\right)}^{3/2}\,{\left(e-c\,e\,x\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2), x)
```

3.554 $\int \sqrt{d+cdx}\,(e-cex)^{5/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=613

$$-\frac{8b^2e^2\sqrt{d+cdx}\,\sqrt{e-cex}}{9c}-\frac{15}{64}b^2e^2x\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{4b^2e^2\sqrt{d+c}}{}$$

```
[Out] -8/9*b^2*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*e^2*x*(c*d*x+d)^(
1/2)*(-c*e*x+e)^(1/2)-1/32*b^2*c^2*e^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)
-4/27*b^2*e^2*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+3/8*e^2*x*(a+
b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/4*c^2*e^2*x^3*(a+b*arcs
in(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+2/3*e^2*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+15/64*b^2*e^2*arcsin(c*x)*(c*d
*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/3*b*e^2*x*(a+b*arcsin(c
*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-3/8*b*c*e^2*x^2*(a
+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+4/9*b*c
^2*e^2*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^
(1/2)-1/8*b*c^3*e^2*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/
(-c^2*x^2+1)^(1/2)+5/24*e^2*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^
(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.70, antiderivative size = 613, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4783, 4795}

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-8*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*e^2*x*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])/32 - (4*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c)
+ (15*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c
^2*x^2]) - (4*b*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/
(3*Sqrt[1 - c^2*x^2]) - (3*b*c*e^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
 b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) + (4*b*c^2*e^2*x^3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*e^2*x^4*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2])
+ (3*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*
e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 + (2*e^2*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
 (5*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt
[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
```

```
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
```

```
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \sqrt{d+cdx}\,(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int (e-cex)^2\sqrt{1-c^2x^2}\,(a+b\sin}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int\left(e^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)\right.}{}$$

$$= \frac{\left(e^2\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}e^2x\sqrt{d+cdx}\,\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{4}c^2e^2x^3\sqrt{}$$

$$= -\frac{4be^2x\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))}{3\sqrt{1-c^2x^2}}-\frac{bce^2x^2\sqrt{}}{}$$

$$= -\frac{1}{4}b^2e^2x\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\,\sqrt{}$$

$$= -\frac{15}{64}b^2e^2x\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\,\sqrt{}$$

$$= -\frac{8b^2e^2\sqrt{d+cdx}\,\sqrt{e-cex}}{9c}-\frac{15}{64}b^2e^2x\sqrt{d+cdx}\,\sqrt{e-}$$

Mathematica [A]
time = 1.43, size = 555, normalized size = 0.91

$$\frac{1440b^2e^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^3-4320a^2\sqrt{d}\,e^{5/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)-12be^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)\left(576bcx-768a\sqrt{1-c^2x^2}+768ac^2x^2\sqrt{1-c^2x^2}-144b\cos(2\text{ArcSin}(cx))+9b\cos(4\text{ArcSin}(cx))-288a\sin(2\text{ArcSin}(cx))+64b\sin(3\text{ArcSin}(cx))+36a\sin(4\text{ArcSin}(cx))\right)+72be^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^2\left(60a+48b\sqrt{1-c^2x^2}+16b\cos(3\text{ArcSin}(cx))+24b\sin(2\text{ArcSin}(cx))-3b\sin(4\text{ArcSin}(cx))\right)+e^2\sqrt{d+cdx}\,\sqrt{e-cex}\left(1728ab\cos(2\text{ArcSin}(cx))-256b^2\cos(3\text{ArcSin}(cx))+3\left(-3072abcx+1024abc^3x^3+1536a^2\sqrt{1-c^2x^2}-2304b^2\sqrt{1-c^2x^2}+864a^2cx\sqrt{1-c^2x^2}-1536a^2c^2x^2\sqrt{1-c^2x^2}+576a^2c^3x^3\sqrt{1-c^2x^2}-36ab\cos(4\text{ArcSin}(cx))-288b^2\sin(2\text{ArcSin}(cx))+9b^2\sin(4\text{ArcSin}(cx))\right)\right)}{6912c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (1440*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*Sqrt
[d]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/
(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt[1 -
 c^2*x^2] - 144*b*Cos[2*ArcSin[c*x]] + 9*b*Cos[4*ArcSin[c*x]] - 288*a*Sin[2
*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] + 36*a*Sin[4*ArcSin[c*x]]) + 72*b*e
^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(60*a + 48*b*Sqrt[1 - c^2*
x^2] + 16*b*Cos[3*ArcSin[c*x]] + 24*b*Sin[2*ArcSin[c*x]] - 3*b*Sin[4*ArcSin
[c*x]]) + e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*ArcSin[c*x]]
- 256*b^2*Cos[3*ArcSin[c*x]] + 3*(-3072*a*b*c*x + 1024*a*b*c^3*x^3 + 1536*a
^2*Sqrt[1 - c^2*x^2] - 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*Sqrt[1 - c^
2*x^2] - 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*Sqrt[1 - c^2*
x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]] + 9*b^2*Sin[4
*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \sqrt{cdx+d}\,\left(-cex+e\right)^{\frac{5}{2}} \left(a+b\arcsin\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/24*(15*sqrt(-c^2*d*x^2*e + d*e)*x*e^2 - 6*(-c^2*d*x^2*e + d*e)^(3/2)*x*e/
d + 15*sqrt(d)*arcsin(c*x)*e^(5/2)/c + 16*(-c^2*d*x^2*e + d*e)^(3/2)*e/(c*d
))*a^2 + sqrt(d)*e^(1/2)*integrate(((b^2*c^2*x^2*e^2 - 2*b^2*c*x*e^2 + b^2*
e^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*x^2*e^2 - 2*
a*b*c*x*e^2 + a*b*e^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x
 + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(((b^2*c^2*x^2 - 2*b^2*c*x + b^2)*arcsin(c*x)^2*e^2 + 2*(a*b*c^2*x^
2 - 2*a*b*c*x + a*b)*arcsin(c*x)*e^2 + (a^2*c^2*x^2 - 2*a^2*c*x + a^2)*e^2)
*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 8568 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\,(e-c\,e\,x)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(5/2), x)
```

3.555 $\int \frac{(e-cex)^{5/2}(a+b\textbf{ArcSin}(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal. Leaf size=559

$$-\frac{68b^2e^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2e^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{3b^2e^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}}-$$

```
[Out] -68/9*b^2*e^3*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/4*b^2*e^3*x
*(-c^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2/27*b^2*e^3*(-c^2*x^2+1)^2/
c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+11/3*e^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^
2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/2*e^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x
))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*c*e^3*x^2*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/4*b^2*e^3*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-22/3*b*e^3*x*(a+b*arcsin(c*x)
)*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/2*b*c*e^3*x^2*(a+b*
arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/9*b*c^2*
e^3*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/
2)+5/6*e^3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e
*x+e)^(1/2)
```

Rubi [A]
time = 0.48, antiderivative size = 559, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8, 2713}

$$\frac{5e^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{6bc\sqrt{cdx+d}\sqrt{e-cex}}+\frac{ce^3x^2(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{3e^3x(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{11e^3(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{3bce^3x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2\sqrt{cdx+d}\sqrt{e-cex}}-\frac{22be^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2bc^2e^3x^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9\sqrt{cdx+d}\sqrt{e-cex}}-\frac{3b^2e^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2e^3(1-c^2x^2)^2}{27c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{cdx+d}\sqrt{e-cex}}-\frac{68b^2e^3(1-c^2x^2)}{9c\sqrt{cdx+d}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (-68*b^2*e^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*
e^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*e^3*(1 -
c^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*e^3*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (22*b*e^3*x*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (
3*b*c*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (2*b*c^2*e^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (11*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*e^3*x*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (c*e^3*x^2*(1 - c^2*x
^2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*e^3*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int (a+bx)^2(ce-ce\sin(x))^3\,dx, x, \sin^{-1}(cx)\right)}{c^4\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int \left(c^3e^3(a+bx)^2-3c^3e^3(a+bx)^2\sin(x)+3c^3e^3(a\right.\right.}{c^4\sqrt{d+cdx}\,\sqrt{e-}$$

$$= \frac{e^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{\left(e^3\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (a+bx)^2\right.}{c\sqrt{d+cdx}\,\sqrt{e-}$$

$$= \frac{3bce^3x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{2bc^2e^3x^3\sqrt{1-c^2x^2}\left(a+b\sin\right.}{9\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{6be^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{3bce^3x}{}$$

$$= -\frac{56b^2e^3(1-c^2x^2)}{9c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2b^2e^3(1-}{27c\sqrt{d+cdx}}$$

$$= -\frac{68b^2e^3(1-c^2x^2)}{9c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2b^2e^3(1-}{27c\sqrt{d+cdx}}$$

Mathematica [A]

time = 1.89, size = 473, normalized size = 0.85

$$\frac{180b^2e^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-540a^2\sqrt{d}\,e^{5/2}\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)-6be^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)\left(264bcx+8bc^3x^3-270a\sqrt{1-c^2x^2}+108acx\sqrt{1-c^2x^2}+27b\cos(2\mathrm{ArcSin}(cx))+6a\cos(3\mathrm{ArcSin}(cx))\right)+18be^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2\left(30a+45b\sqrt{1-c^2x^2}-b\cos(3\mathrm{ArcSin}(cx))-9b\sin(2\mathrm{ArcSin}(cx))\right)+e^2\sqrt{d+cdx}\,\sqrt{e-cex}\left(-1620abcx+792a^2\sqrt{1-c^2x^2}-1620b^2\sqrt{1-c^2x^2}-324a^2cx\sqrt{1-c^2x^2}+72a^2c^2x^2\sqrt{1-c^2x^2}-162ab\cos(2\mathrm{ArcSin}(cx))+4b^2\cos(3\mathrm{ArcSin}(cx))+81b^2\sin(2\mathrm{ArcSin}(cx))+12ab\sin(3\mathrm{ArcSin}(cx))\right)}{216cd\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (180*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 540*a^2*Sqrt[d
]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 6*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*A
rcSin[c*x]*(264*b*c*x + 8*b*c^3*x^3 - 270*a*Sqrt[1 - c^2*x^2] + 108*a*c*x*S
qrt[1 - c^2*x^2] + 27*b*Cos[2*ArcSin[c*x]] + 6*a*Cos[3*ArcSin[c*x]]) + 18*b
*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(30*a + 45*b*Sqrt[1 - c^
2*x^2] - b*Cos[3*ArcSin[c*x]] - 9*b*Sin[2*ArcSin[c*x]]) + e^2*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(-1620*a*b*c*x + 792*a^2*Sqrt[1 - c^2*x^2] - 1620*b^2*Sq
rt[1 - c^2*x^2] - 324*a^2*c*x*Sqrt[1 - c^2*x^2] + 72*a^2*c^2*x^2*Sqrt[1 - c
^2*x^2] - 162*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] + 81*b^2*Si
n[2*ArcSin[c*x]] + 12*a*b*Sin[3*ArcSin[c*x]]))/(216*c*d*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(-cex+e)^{\frac{5}{2}}\,(a+b\arcsin(cx))^2}{\sqrt{cdx+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="maxima")
```

```
[Out] 1/6*(2*sqrt(-c^2*d*x^2*e + d*e)*c*x^2*e^2/d - 9*sqrt(-c^2*d*x^2*e + d*e)*x*
e^2/d + 15*arcsin(c*x)*e^(5/2)/(c*sqrt(d)) + 22*sqrt(-c^2*d*x^2*e + d*e)*e^
2/(c*d))*a^2 + sqrt(d)*e^(1/2)*integrate(((b^2*c^2*x^2*e^2 - 2*b^2*c*x*e^2
+ b^2*e^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*x^2*e^
2 - 2*a*b*c*x*e^2 + a*b*e^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sq
rt(c*x + 1)*sqrt(-c*x + 1)/(c*d*x + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(((b^2*c^2*x^2 - 2*b^2*c*x + b^2)*arcsin(c*x)^2*e^2 + 2*(a*b*c^2*x^
2 - 2*a*b*c*x + a*b)*arcsin(c*x)*e^2 + (a^2*c^2*x^2 - 2*a^2*c*x + a^2)*e^2)
*sqrt(-(c*x - 1)*e)/sqrt(c*d*x + d), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6189 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{5/2}}{\sqrt{d+c\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(1/2), x)
```

3.556 $\int \frac{(e-cex)^{5/2}(a+b\textbf{ArcSin}(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal. Leaf size=918

$$\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{b^2e^4(1-c^2x^2)^{3/2}\,\mathrm{ArcSin}(}{4c(d+cdx)^{3/2}(e-cex)^{3}}$$

```
[Out] 8*a*b*e^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*b^2*e^4*(
-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/4*b^2*e^4*x*(-c^2*x^2+1)
^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+1/4*b^2*e^4*(-c^2*x^2+1)^(3/2)*arcsin(c
*x)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*b^2*e^4*x*(-c^2*x^2+1)^(3/2)*arcsi
n(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/2*b*c*e^4*x^2*(-c^2*x^2+1)^(3/2)*
(a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*e^4*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*e^4*x*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*I*b^2*e^4*(-c^2*x^2+1)^
(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)
^(3/2)-4*e^4*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e
)^(3/2)+1/2*e^4*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*
x+e)^(3/2)-5/2*e^4*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/
2)/(-c*e*x+e)^(3/2)-8*I*e^4*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x
+d)^(3/2)/(-c*e*x+e)^(3/2)+16*b*e^4*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln
(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-16*I*b^
2*e^4*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d
)^(3/2)/(-c*e*x+e)^(3/2)-32*I*b*e^4*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ar
ctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*e
^4*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^
(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A]
time = 0.92, antiderivative size = 918, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 19, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.594$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267, 4795, 4723, 327, 222}

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (8*a*b*e^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
8*b^2*e^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*e
^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*e^4*(1
 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
(8*b^2*e^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x
```

```
)^(3/2)) - (b*c*e^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - (8*e^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*e^4*x*(1 - c^2*x^2)*(a + b*Ar
cSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*e^4*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(4*e^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e
*x)^(3/2)) + (e^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^(
3/2)*(e - c*e*x)^(3/2)) - (5*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3)
/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((32*I)*b*e^4*(1 - c^2*x^2)^
(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) + (16*b*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1
 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I
)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*I)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLo
g[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)
*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}}\,dx=\frac{(1-c^2x^2)^{3/2}\int \frac{(e-cex)^4\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$=\frac{(1-c^2x^2)^{3/2}\int \left(\frac{8(e^4-ce^4x)\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{3/2}}-\frac{7e^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}+\frac{4ce^4x(a+b}{\sqrt{1-}}\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$=\frac{\left(8(1-c^2x^2)^{3/2}\right)\int \frac{(e^4-ce^4x)\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(7e^4(1-c^2x^2)^{3/2}\right)\int}{(d+cdx)^{3/2}(e-}$$

$$=-\frac{4e^4(1-c^2x^2)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{e^4x(1-c^2x^2)^2\left(a+b\sin^{-1}(cx)\right)}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$=\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{bce^4x^2(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{2(d+cdx)^{3/2}(e-cex)^{3/2}}-4e$$

$$=\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4x(1-c}{(d+cdx)^3}$$

$$=\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1}{4(d+cdx)^{3/2}}$$

$$=\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1}{4(d+cdx)^{3/2}}$$

$$=\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1}{4(d+cdx)^{3/2}}$$

$$=\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1}{4(d+cdx)^{3/2}}$$

$$=\frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1}{4(d+cdx)^{3/2}}$$

<u>**Mathematica**</u> **[A]**
time = 8.22, size = 1642, normalized size = 1.79

Too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

[Out] (e^2*(12*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(-24 - 7*c*x + c^2*x^2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 180*a^2*Sqrt[d]*Sqrt[e]*(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 24*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]) - 8*b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((6 + 6*I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) + ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) - 96*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - 16*b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - I*c*x - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*(Sqrt[1 - c^2*x^2] + 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*ArcSin[c*x]^2*(((2 + 2*I) + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + ((-2 + 2*I) + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - 2*b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(10*ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 3*ArcSin[c*x]*((8*I)*Pi + 16*c*x + Cos[2*ArcSin[c*x]] + 32*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*(-16*Sqrt[1 - c^2*x^2] + c*x*Sqrt[1 - c^2*x^2] - 32*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 16*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 32*Pi*Log[Cos[ArcSin[c*x]/2]] + 16*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (96*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2]*((8 + 8*I) + 8*Sqrt[1 - c^2*x^2] - Sin[2*ArcSin[c*x]]) - Sin[ArcSin[c*x]/2]*((8 - 8*I) - 8*Sqrt[1 - c^2*x^2] + Sin[2*ArcSin[c*x]]))) - 3*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*(16*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 2*ArcSin[c*x]*(24*Cos[ArcSin[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSin[c*x])/2] - 24*Sin[ArcSin[c*x]/2] + 7*Sin[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2]))))/(24*c*d^2*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(-cex+e)^{\frac{5}{2}} (a+b\arcsin{(cx)})^2}{(cdx+d)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="maxima")
```

```
[Out] -1/2*(c^2*x^3*e^3/(sqrt(-c^2*d*x^2*e + d*e)*d) - 8*c*x^2*e^3/(sqrt(-c^2*d*x
^2*e + d*e)*d) - 17*x*e^3/(sqrt(-c^2*d*x^2*e + d*e)*d) + 15*arcsin(c*x)*e^(
5/2)/(c*d^(3/2)) + 24*e^3/(sqrt(-c^2*d*x^2*e + d*e)*c*d))*a^2 + sqrt(d)*e^(
1/2)*integrate(((b^2*c^2*x^2*e^2 - 2*b^2*c*x*e^2 + b^2*e^2)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*x^2*e^2 - 2*a*b*c*x*e^2 + a*b*e^
2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)
/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral(((b^2*c^2*x^2 - 2*b^2*c*x + b^2)*arcsin(c*x)^2*e^2 + 2*(a*b*c^2*x^
2 - 2*a*b*c*x + a*b)*arcsin(c*x)*e^2 + (a^2*c^2*x^2 - 2*a^2*c*x + a^2)*e^2)
*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6189 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{5/2}}{(d+c\,d\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(3/2), x)
```

3.557 $\int \frac{(e-cex)^{5/2}(a+b\textbf{ArcSin}(cx))^2}{(d+cdx)^{5/2}} dx$

Optimal. Leaf size=729

$$-\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2b^2e^5x(1-c^2x^2)^{5/2}\operatorname{ArcSin}(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{28ie^5(1-c^2x^2)^{5/2}(}{3c(d+cdx)^{5/}}$$

```
[Out] -2*a*b*e^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2*b^2*e^5*
(-c^2*x^2+1)^3/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2*b^2*e^5*x*(-c^2*x^2+1)^
(5/2)*arcsin(c*x)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+28/3*I*e^5*(-c^2*x^2+1)^
(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+e^5*(-c^2*x^2+
1)^3*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+5/3*e^5*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-16/3*b
^2*e^5*(-c^2*x^2+1)^(5/2)*cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c
*e*x+e)^(5/2)+28/3*e^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/
2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-8/3*b*e^5*(-c^2*x^2+1)^(5
/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e
*x+e)^(5/2)-4/3*e^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*a
rcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2
)-112/3*b*e^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+
1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+112/3*I*b^2*e^5*(-c^2*x^2+1)^
(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^
(5/2)
```

Rubi [A]
time = 0.91, antiderivative size = 729, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 16, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4763, 4859, 4737, 4767, 4715, 267, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\frac{5e^5(1-c^2x^2)^{5/2}(a+b\operatorname{ArcSin}(cx))^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{e^5(1-c^2x^2)^3(a+b\operatorname{ArcSin}(cx))^2}{c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{28ie^5(1-c^2x^2)^{5/2}(a+b\operatorname{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{112be^5(1-c^2x^2)^{5/2}\log\left(1-ie^{i\operatorname{ArcSin}(cx)}\right)(a+b\operatorname{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{28e^5(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\operatorname{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\operatorname{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{8be^5(1-c^2x^2)^{5/2}\csc^2\left(\frac{1}{2}\operatorname{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\operatorname{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4e^5(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\operatorname{ArcSin}(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\operatorname{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\operatorname{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2abe^5x(1-c^2x^2)^{5/2}}{(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{112ib^2e^5(1-c^2x^2)^{5/2}\operatorname{Li}_2\left(ie^{i\operatorname{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2b^2e^5x(1-c^2x^2)^{5/2}\operatorname{ArcSin}(cx)}{(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{16b^2e^5(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\operatorname{ArcSin}(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2b^2e^5(1-c^2x^2)^3}{c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (-2*a*b*e^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
(2*b^2*e^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b^
2*e^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) + (((28*I)/3)*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*e^5*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (16*b^2*e^5
*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) + (28*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4
```

```
 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b*e^5*(1
- c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin
[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcS
in[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(
5/2)) + (((112*I)/3)*b^2*e^5*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(e-cex)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(e-cex)^5\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{5e^5\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \frac{ce^5x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{8e^5\left(a+b\sin^{-1}(cx\right.}{(1+cx)^2\sqrt{1-c}}\right.}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(5e^5(1-c^2x^2)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8e^5(1-c^2x^2)^{5/2}\right)\int \frac{(a+b}{(1+cx)^2}}{(d+cdx)^{5/2}(e-ce}$$

$$= \frac{e^5(1-c^2x^2)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^5(1-c^2x^2)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1}{3}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-c^2x^2)^{5/2}\sin^{-1}(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^5(1-}{c(d}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-}{(d+cdx}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-}{(d+cdx}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-}{(d+cdx}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-}{(d+cdx}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-}{(d+cdx}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2338 vs. $2(729) = 1458$.
time = 10.15, size = 2338, normalized size = 3.21

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((a^2*e^2)/d^3 - (8*a^2*e^2)/(3*d^
3*(1 + c*x)^2) + (28*a^2*e^2)/(3*d^3*(1 + c*x))))/c - (5*a^2*e^(5/2)*ArcTan
[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*
(1 + c*x))])/(c*d^(5/2)) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(
d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c
x]/2](-8 + 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] +
Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[
c*x] + 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4*ArcSin[
c*x] + 6*ArcSin[c*x]^2 + Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*ArcSin[c*x]
) - 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[
(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (a
*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcS
in[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*Ar
cSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + 2*Arc
Sin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 4*Log[Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2]] - 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e
x)](Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (b^2*e^2*(-1 + c*x)*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-6*c*x*ArcSin[c*x
])/Sqrt[1 - c^2*x^2] + ((13 + 13*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (3*A
rcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + 3*(-2 + ArcSin[c*x]^2) + (13*((-I)*Pi*Arc
Sin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[
1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi
+ 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2
*x^2] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2])^3) - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Sqrt
[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*(4 - 13*Arc
Sin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]))))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2])^2) - (b^2*e^2*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-I)*Pi*ArcSin[c*x] + (1 + I)*ArcSin[
c*x]^2 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1
- I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi +
2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]
^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 - (2*Arc
Sin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (
2*(-4 + ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2])))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[
ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) + (2*b^2*e^2*(-1 + c*x)*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((7*I)*Pi*ArcSin[c*x] - (7
+ 7*I)*ArcSin[c*x]^2 - ArcSin[c*x]^3 + 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])]
+ 14*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 28*Pi*Log[Cos[ArcS
in[c*x]/2]] - 14*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (28*I)*PolyLog[2, I*

```
E^(I*ArcSin[c*x])] - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/
2] + Sin[ArcSin[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (2*(-4 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]
/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[(-d - c*d*x)
*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2
) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(3*Cos[(5*ArcSin[c*x])/2] - 3*ArcSin
[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(-20 + 24*ArcSin[c*x] + 2
7*ArcSin[c*x]^2 - 156*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(
3*ArcSin[c*x])/2]*(9 + 35*ArcSin[c*x] - 9*ArcSin[c*x]^2 + 52*Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 20*Sin[ArcSin[c*x]/2] - 24*ArcSin[c*x]*Si
n[ArcSin[c*x]/2] + 27*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] - 156*Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[ArcSin[c*x]/2] - 9*Sin[(3*ArcSin[c*x])/2
] + 35*ArcSin[c*x]*Sin[(3*ArcSin[c*x])/2] + 9*ArcSin[c*x]^2*Sin[(3*ArcSin[c
*x])/2] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[(3*ArcSin[c*x
])/2] + 3*Sin[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Sin[(5*ArcSin[c*x])/2]))/(
6*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2])^4)
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(-cex+e)^{\frac{5}{2}} (a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="maxima")
```

```
[Out] 1/3*(3*(-c^2*d*x^2*e + d*e)^(5/2)/(c^5*d^5*x^4 + 4*c^4*d^5*x^3 + 6*c^3*d^5*
x^2 + 4*c^2*d^5*x + c*d^5) - 5*(-c^2*d*x^2*e + d*e)^(3/2)*e/(c^4*d^4*x^3 +
3*c^3*d^4*x^2 + 3*c^2*d^4*x + c*d^4) - 10*sqrt(-c^2*d*x^2*e + d*e)*e^2/(c^3
*d^3*x^2 + 2*c^2*d^3*x + c*d^3) + 35*sqrt(-c^2*d*x^2*e + d*e)*e^2/(c^2*d^3*
x + c*d^3) + 15*arcsin(c*x)*e^(5/2)/(c*d^(5/2)))*a^2 + sqrt(d)*e^(1/2)*inte
grate(((b^2*c^2*x^2*e^2 - 2*b^2*c*x*e^2 + b^2*e^2)*arctan2(c*x, sqrt(c*x +
```

```
1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*x^2*e^2 - 2*a*b*c*x*e^2 + a*b*e^2)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^3*d^3
*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="fricas")
[Out] integral(((b^2*c^2*x^2 - 2*b^2*c*x + b^2)*arcsin(c*x)^2*e^2 + 2*(a*b*c^2*x^
2 - 2*a*b*c*x + a*b)*arcsin(c*x)*e^2 + (a^2*c^2*x^2 - 2*a^2*c*x + a^2)*e^2)
*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*
x + d^3), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
[Out] Exception raised: SystemError >> excessive stack use: stack is 6189 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="giac")
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(e-c\,e\,x\right)}^{5/2}}{{\left(d+c\,d\,x\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(5/2), x)
```

3.558 $\int \frac{(d+cdx)^{5/2}(a+b\text{ArcSin}(cx))^2}{\sqrt{e-cex}}\,dx$

Optimal. Leaf size=559

$$\frac{68b^2d^3(1-c^2x^2)}{9c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{2b^2d^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{3b^2d^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c\sqrt{d+cdx}\,\sqrt{e-cex}}+\cdots$$

```
[Out] 68/9*b^2*d^3*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/4*b^2*d^3*x*
(-c^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/27*b^2*d^3*(-c^2*x^2+1)^2/c
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-11/3*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2
/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/2*d^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x)
)^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*c*d^3*x^2*(-c^2*x^2+1)*(a+b*arcsin
(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/4*b^2*d^3*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+22/3*b*d^3*x*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/2*b*c*d^3*x^2*(a+b*a
rcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2/9*b*c^2*d
^3*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2
)+5/6*d^3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*
x+e)^(1/2)
```

Rubi [A]
time = 0.45, antiderivative size = 559, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8, 2713}

$$\frac{5d^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{6bc\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{cd^3x^2(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{3d^3x(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{2\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{11d^3(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3c\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{3bcd^3x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{2\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{22bd^3x\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{3\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2bc^2d^3x^3\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{3b^2d^3\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{4c\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2b^2d^3(1-c^2x^2)^2}{27c\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{68b^2d^3(1-c^2x^2)}{9c\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (68*b^2*d^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*d
^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*d^3*(1 - c
^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*d^3*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (22*b*d^3*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3
*b*c*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]) + (2*b*c^2*d^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - (11*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*d^3*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (c*d^3*x^2*(1 - c^2*x^
2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*d^3*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2(cd+cd\sin(x))^3\,dx, x, \sin^{-1}(cx)\right)}{c^4\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int \left(c^3d^3(a+bx)^2+3c^3d^3(a+bx)^2\sin(x)+3c^3d^3(a\right.\right.}{c^4\sqrt{d+cdx}\,\sqrt{e-}}$$

$$= \frac{d^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\left(d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\right.}{c\sqrt{d+cdx}\,\sqrt{e}}$$

$$= \frac{3bcd^3x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}\left(a+b\sin\right.}{9\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{6bd^3x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{3bcd^3}{}$$

$$= \frac{56b^2d^3(1-c^2x^2)}{9c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{2b^2d^3(1-c}{27c\sqrt{d+cdx}\,\sqrt{}}$$

$$= \frac{68b^2d^3(1-c^2x^2)}{9c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{2b^2d^3(1-c}{27c\sqrt{d+cdx}\,\sqrt{}}$$

Mathematica [A]

time = 2.13, size = 434, normalized size = 0.78

$$-\frac{d^2\left(-180b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3+540a^2\sqrt{d}\,\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)-6b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)\left(-18b+264bcx+36bc^2x^2+8bc^3x^3-270a\sqrt{1-c^2x^2}-108acx\sqrt{1-c^2x^2}-9b\cos(2\mathrm{ArcSin}(cx))+6a\cos(3\mathrm{ArcSin}(cx))\right)+18b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2\left(-30a+9b(5+2cx)\sqrt{1-c^2x^2}-b\cos(3\mathrm{ArcSin}(cx))\right)+\sqrt{d+cdx}\,\sqrt{e-cex}\left(6\left(-27b^2(10+cx)\sqrt{1-c^2x^2}-8abcx(33+c^2x^2)+6a^2\sqrt{1-c^2x^2}\,(22+9cx+2c^2x^2)\right)+162ab\cos(2\mathrm{ArcSin}(cx))+4b^2\cos(3\mathrm{ArcSin}(cx))\right)\right)}{216ce\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] -1/216*(d^2*(-180*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 540*a
^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*ArcSin[c*x]*(-18*b + 264*b*c*x + 36*b*c^2*x^2 + 8*b*c^3*x^3 - 270*a*Sqr
t[1 - c^2*x^2] - 108*a*c*x*Sqrt[1 - c^2*x^2] - 9*b*Cos[2*ArcSin[c*x]] + 6*a
*Cos[3*ArcSin[c*x]]) + 18*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(
-30*a + 9*b*(5 + 2*c*x)*Sqrt[1 - c^2*x^2] - b*Cos[3*ArcSin[c*x]]) + Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(6*(-27*b^2*(10 + c*x)*Sqrt[1 - c^2*x^2] - 8*a*b*c
*x*(33 + c^2*x^2) + 6*a^2*Sqrt[1 - c^2*x^2]*(22 + 9*c*x + 2*c^2*x^2)) + 162
*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]])))/(c*e*Sqrt[1 - c^2*x^2
])
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{5}{2}}\,(a+b\arcsin(cx))^2}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] -1/6*(2*sqrt(-c^2*d*x^2*e + d*e)*c*d^2*x^2*e^(-1) + 9*sqrt(-c^2*d*x^2*e + d
*e)*d^2*x*e^(-1) - 15*d^(5/2)*arcsin(c*x)*e^(-1/2)/c + 22*sqrt(-c^2*d*x^2*e
 + d*e)*d^2*e^(-1)/c)*a^2 - sqrt(d)*e^(1/2)*integrate(((b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a
*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c*x*e - e), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x
+ a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)*e^(-1)/(c*x - 1)
, x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6189 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}}{\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(1/2), x)
```

3.559 $\int \frac{(d+cdx)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{e-cex}}\,dx$

Optimal. Leaf size=398

$$\frac{4b^2d^2(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{b^2d^2x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{b^2d^2\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)}{4c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{4bd^2x\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSi}}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

```
[Out] 4*b^2*d^2*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/4*b^2*d^2*x*(-c
^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c
*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/2*d^2*x*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/4*b^2*d^2*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+4*b*d^2*x*(a+b*arcsin(c*x))*(
-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*b*c*d^2*x^2*(a+b*arc
sin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*d^2*(a+b*
arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.39, antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.281$, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8}

$$\frac{d^2\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))^3}{2bc\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2d^2(1-c^2x^2)\,(a+b\mathrm{ArcSin}(cx))^2}{c\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{d^2x(1-c^2x^2)\,(a+b\mathrm{ArcSin}(cx))^2}{2\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{2\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{4bd^2x\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{b^2d^2\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)}{4c\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{4b^2d^2(1-c^2x^2)}{c\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{b^2d^2x(1-c^2x^2)}{4\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (4*b^2*d^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*d^2*x*
(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*d^2*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*d^2*x*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*d
^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]) - (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
```

```
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{e-cex}}\,dx &= \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}} \\
&= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int (a+bx)^2(cd+cd\sin(x))^2\,dx, x, \sin^{-1}(cx)\right)}{c^3\sqrt{d+cdx}\,\sqrt{e-cex}} \\
&= \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int \left(c^2d^2(a+bx)^2+2c^2d^2(a+bx)^2\sin(x)+c^2d^2(a\right.\right.}{c^3\sqrt{d+cdx}\,\sqrt{e-cex}} \\
&= \frac{d^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{\left(d^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int (a+bx\right.}{c\sqrt{d+cdx}\,\sqrt{e}} \\
&= \frac{bcd^2x^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{2d^2(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right.}{c\sqrt{d+cdx}\,\sqrt{e-cex}} \\
&= \frac{b^2d^2x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{4bd^2x\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{bcd^2}{} \\
&= \frac{4b^2d^2(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{b^2d^2x(1-c^2x^2)}{4\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{b^2d^2\sqrt{1-c^2x^2}}{4c\sqrt{d+cdx}\,\sqrt{}}
\end{aligned}
$$

Mathematica [A]
time = 1.23, size = 344, normalized size = 0.86

$$\frac{bd\sqrt{d+cdx}\,\sqrt{e-cex}\left(-4a(4+cx)\sqrt{1-c^2x^2}+b(-1+16cx+2c^2x^2)\right)\mathrm{ArcSin}(cx)-2bd\sqrt{d+cdx}\,\sqrt{e-cex}\left(-3a+b(4+cx)\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)^2+2b^2d\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-6a^2d^{3/2}\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)+d\sqrt{d+cdx}\,\sqrt{e-cex}\left(16abcx-2a^2(4+cx)\sqrt{1-c^2x^2}+b^2(16+cx)\sqrt{1-c^2x^2}-ab\cos(2\mathrm{ArcSin}(cx))\right)}{4ce\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4*a*(4 + c*x)*Sqrt[1 - c^2*x^2] + b*
(-1 + 16*c*x + 2*c^2*x^2))*ArcSin[c*x] - 2*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(-3*a + b*(4 + c*x)*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b^2*d*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 6*a^2*d^(3/2)*Sqrt[e]*Sqrt[1 - c^2*
x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^
2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(16*a*b*c*x - 2*a^2*(4 + c*x)*
Sqrt[1 - c^2*x^2] + b^2*(16 + c*x)*Sqrt[1 - c^2*x^2] - a*b*Cos[2*ArcSin[c*x
]]))/(4*c*e*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{3}{2}} (a+b\arcsin(cx))^2}{\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
[Out] -1/2*(sqrt(-c^2*d*x^2*e + d*e)*d*x*e^(-1) - 3*d^(3/2)*arcsin(c*x)*e^(-1/2)/
c + 4*sqrt(-c^2*d*x^2*e + d*e)*d*e^(-1)/c)*a^2 - sqrt(d)*e^(1/2)*integrate(
((b^2*c*d*x + b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*
c*d*x + a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sq
rt(-c*x + 1)/(c*x*e - e), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
[Out] integral(-(a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c
*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)*e^(-1)/(c*x -
 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(d(cx+1))^{\frac{3}{2}} (a+b\operatorname{asin}(cx))^2}{\sqrt{-e(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/sqrt(-e*(c*x - 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\right)}^{3/2}}{\sqrt{e-c\,e\,x}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(1/2), x)
```

3.560 $\int \frac{\sqrt{d+cdx}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{e-cex}}\,dx$

Optimal. Leaf size=231

$$\frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2b^2d(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))}{c\sqrt{d+cdx}\,\sqrt{e-cex}}$$

```
[Out] 2*b^2*d*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-d*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*a*b*d*x*(-c^2*x^2+1)^(
1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b^2*d*x*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*d*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)
^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {4763, 4847, 4737, 4767, 4715, 267}

$$\frac{d\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2b^2d(1-c^2x^2)}{c\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (2*a*b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*
(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*x*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (d*(1 - c^2*x^2)*(a
 + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (d*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sqrt{d+cdx}\,(a+b\sin^{-1}(cx))^2}{\sqrt{e-cex}}\,dx &= \frac{\sqrt{1-c^2x^2}\int\frac{(d+cdx)(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}} \\
&= \frac{\sqrt{1-c^2x^2}\int\left(\frac{d(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}+\frac{cdx(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\,\sqrt{e-cex}} \\
&= \frac{\left(d\sqrt{1-c^2x^2}\right)\int\frac{(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\left(cd\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}}{\sqrt{d+cdx}\,\sqrt{e-cex}} \\
&= -\frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{d\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{(2}{} \\
&= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{d(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{d\sqrt{1-c^2x^2}\,(}{3bc\sqrt{d+c} } \\
&= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2b^2dx\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{d(1-c^2x^2)\,(a+}{c\sqrt{d+cdx}} \\
&= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2b^2d(1-c^2x^2)}{c\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2b^2dx\sqrt{1-c^2x^2}\,\sin}{\sqrt{d+cdx}\,\sqrt{e-c}}
\end{aligned}
$$

Mathematica [A]
time = 0.56, size = 298, normalized size = 1.29

$$
\frac{3\sqrt{d+cdx}\,\sqrt{e-cex}\left(2abcx-a^2\sqrt{1-c^2x^2}+2b^2\sqrt{1-c^2x^2}\right)+6b\sqrt{d+cdx}\,\sqrt{e-cex}\left(bcx-a\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)+3b\sqrt{d+cdx}\,\sqrt{e-cex}\left(a-b\sqrt{1-c^2x^2}\right)\mathrm{ArcSin}(cx)^2+b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-3a^2\sqrt{d}\,\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)}{3ce\sqrt{1-c^2x^2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*a*b*c*x - a^2*Sqrt[1 - c^2*x^2] + 2*b
^2*Sqrt[1 - c^2*x^2]) + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(b*c*x - a*Sqrt
[1 - c^2*x^2])*ArcSin[c*x] + 3*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a - b*Sqr
t[1 - c^2*x^2])*ArcSin[c*x]^2 + b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[
c*x]^3 - 3*a^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))])/(3*c*e*Sqrt[1 - c^2*x
^2])
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$
\int \frac{\sqrt{cdx+d}\,\left(a+b\arcsin\left(cx\right)\right)^2}{\sqrt{-cex+e}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] (sqrt(d)*arcsin(c*x)*e^(-1/2)/c - sqrt(-c^2*d*x^2*e + d*e)*e^(-1)/c)*a^2 -
sqrt(d)*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*
x + 1)/(c*x*e - e), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-1)/(c*x - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\,(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-e\,(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))**2/sqrt(-e*(c*x - 1)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}}{\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(1/2), x)
```

3.561 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=55

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(
1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {4763, 4737}

$$\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$
$$= \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 159 vs. 2(55) = 110.
time = 0.49, size = 159, normalized size = 2.89

$$\frac{\frac{3ab\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^3}{\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{3a^2\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)}{\sqrt{d}\,\sqrt{e}}}{3c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
+ (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) -
 (3*a^2*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 +
 c^2*x^2))])/(Sqrt[d]*Sqrt[e]))/(3*c)
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [A]
time = 0.51, size = 53, normalized size = 0.96

$$\frac{b^2\arcsin(cx)^3\,e^{\left(-\frac{1}{2}\right)}}{3\,c\sqrt{d}}+\frac{ab\arcsin(cx)^2\,e^{\left(-\frac{1}{2}\right)}}{c\sqrt{d}}+\frac{a^2\arcsin(cx)\,e^{\left(-\frac{1}{2}\right)}}{c\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] 1/3*b^2*arcsin(c*x)^3*e^(-1/2)/(c*sqrt(d)) + a*b*arcsin(c*x)^2*e^(-1/2)/(c*
sqrt(d)) + a^2*arcsin(c*x)*e^(-1/2)/(c*sqrt(d))
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-1)/(c^2*d*x^2 - d), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}{(cx)})^2}{\sqrt{d(cx+1)}\sqrt{-e(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.562 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=455

$$-\frac{e(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{ex(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{ie(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{4i\ldots}{\ldots}$$

```
[Out] -e*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+e*x*
(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*e*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b*
e*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(
c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*e*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*
ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*I*b
^2*e*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d
)^(3/2)/(-c*e*x+e)^(3/2)-2*I*b^2*e*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*e*(-c^2*x^2+1)^
(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)
^(3/2)
```

Rubi [A]
time = 0.48, antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {4763, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266}

$$-\frac{4ibe(1-c^2x^2)^{3/2}\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ie(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{e(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{ex(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2be(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2ib^2e(1-c^2x^2)^{3/2}\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2e(1-c^2x^2)^{3/2}\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2e(1-c^2x^2)^{3/2}\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] -((e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2))) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) - (I*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
+ (2*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*
x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((2*I)*b^2*e*(1 - c^2*x^2)^
(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2)) - ((2*I)*b^2*e*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*e*(1 - c^2*x^2)^(3/2)*Poly
Log[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{e\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{cex\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(e\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(ce\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} d}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2be(1\right.}{(}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2be(1\right.}{}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie(1-}{c(}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie(1-}{c(}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie(1-}{c(}$$

$$= -\frac{e\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie(1-}{c(}$$

Mathematica [A]
time = 1.13, size = 225, normalized size = 0.49

$$-\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(-b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2\left(-i+\cot\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+2b\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\left(-a\cot\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)+2b\log\left(1+ie^{-i\text{ArcSin}(cx)}\right)\right)+a\left(-a+acx+4b\sqrt{1-c^2x^2}\,\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)\right)+4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{-i\text{ArcSin}(cx)}\right)\right)}{cd^2e(-1+cx)(1+cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-(b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*(
-I + Cot[(Pi + 2*ArcSin[c*x])/4])) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(-(a
*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[1 + I/E^(I*ArcSin[c*x])]) + a*(-a +
 a*c*x + 4*b*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)/E^(I*ArcSin[c*x])]))/(c*d^2*e*(-1 + c*x
)*(1 + c*x)))
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] b^2*e^(-1/2)*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c*d*x
 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) - 2*sqrt(-c^2*d*x^2*e + d*e
)*a*b*arcsin(c*x)/(c^2*d^2*x*e + c*d^2*e) - sqrt(-c^2*d*x^2*e + d*e)*a^2/(c
^2*d^2*x*e + c*d^2*e) + 2*a*b*e^(-1/2)*log(c*x + 1)/(c*d^(3/2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-1)/(c^3*d^2*x^3 + c^2*d^2*x^2 - c*d^2*x - d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}\sqrt{-e(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*sqrt(-e*(c*x - 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(1/2)), x)
```

3.563 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=896

$$-\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2e^2(1-c^2x^2)^{5/2}\,\text{ArcSin}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{be^2(1-c^2x^2)^{3/2}\,(a+}{3c(d+cdx)^{5/2}(}$$

```
[Out] -2/3*b^2*e^2*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b^2*e^2*
x*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b^2*e^2*(-c^2*x^2+1)^
(5/2)*arcsin(c*x)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*e^2*(-c^2*x^2+1)
^(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b*e^2*x*(-c
^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*c*
e^2*x^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/
2)-2/3*e^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5
/2)+1/3*e^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(
5/2)+1/3*c^2*e^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e
*x+e)^(5/2)+2/3*e^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)+2/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c*x+(-c^2*x
^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*e^2*(-c^2*x^2+1)^(5/
2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b*e^2*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*
x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-4/3*I*b*e^2*(-c^2
*x^2+1)^(5/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,-(I*c*x
+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A]

time = 0.86, antiderivative size = 896, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 18, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.562$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267, 4771, 4791, 294, 222}

[illegible]

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] (-2*b^2*e^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2
*b^2*e^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*
e^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) - (b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(e - c*e*x)^(5/2)) + (2*b*e^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*e^2*x^2*(1 - c^2*x^2)^(3/2)*
```

```
(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*e^2*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
 (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*
x)^(5/2)) + (c^2*e^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x
)^(5/2)*(e - c*e*x)^(5/2)) + (2*e^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2
)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*e^2*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((4*I)/3)
*b*e^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*e^2*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (((2*I)/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*b^2*e^
2*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
```

```
[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(e-cex)^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{e^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}-\frac{2ce^2x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}+\frac{c^2e^2x^2\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\right) d}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2ce^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{2e^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{c^2e^2x}{}$$

$$= -\frac{be^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2be^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{be^2\left(1-c^2x^2\right)^{3/2}}{3c(d+cdx)^{5}}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2e^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2e^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2e^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

$$= -\frac{2b^2e^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2e^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

Mathematica [A]

time = 5.95, size = 369, normalized size = 0.41

$$-\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\left(\frac{2a^2(2+cx)}{(1+cx)^2}+\frac{b^2\left(\cot\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\left(4+\text{ArcSin}(cx)^2\left(2+\csc^2\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)\right)+2\text{ArcSin}(cx)\left(-i\text{ArcSin}(cx)+\csc^2\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)-4\log\left(1+ie^{-i\text{ArcSin}(cx)}\right)\right)-8i\text{PolyLog}\left(2,-ie^{-i\text{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}+\frac{2ab\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\left(2+3\text{ArcSin}(cx)-6\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)+\cos\left(\frac{3}{2}\text{ArcSin}(cx)\right)\left(\text{ArcSin}(cx)+2\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)+2\left(1+\left(-1+\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)-2\left(2+\sqrt{1-c^2x^2}\right)\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)^3}\right)}{6cd^3e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] -1/6*(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((2*a^2*(2 + c*x))/(1 + c*x)^2 + (b^2
*(Cot[(Pi + 2*ArcSin[c*x])/4]*(4 + ArcSin[c*x]^2*(2 + Csc[(Pi + 2*ArcSin[c*
x])/4]^2)) + 2*ArcSin[c*x]*((-I)*ArcSin[c*x] + Csc[(Pi + 2*ArcSin[c*x])/4]^
2 - 4*Log[1 + I/E^(I*ArcSin[c*x])]) - (8*I)*PolyLog[2, (-I)/E^(I*ArcSin[c*x
])]))/Sqrt[1 - c^2*x^2] + (2*a*b*(Cos[ArcSin[c*x]/2]*(2 + 3*ArcSin[c*x] - 6
*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(Ar
cSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(1 + (-1 +
Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c
*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3)))/(c*d^3*e)
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] -2/3*a*b*c*(e^(1/2)/(c^3*d^(5/2)*x*e + c^2*d^(5/2)*e) - e^(-1/2)*log(c*x +
1)/(c^2*d^(5/2))) - 2/3*a*b*(sqrt(-c^2*d*x^2*e + d*e)/(c^3*d^3*x^2*e + 2*c^
2*d^3*x*e + c*d^3*e) + sqrt(-c^2*d*x^2*e + d*e)/(c^2*d^3*x*e + c*d^3*e))*ar
csin(c*x) + b^2*e^(-1/2)*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))^2/((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqr
t(d) - 1/3*a^2*(sqrt(-c^2*d*x^2*e + d*e)/(c^3*d^3*x^2*e + 2*c^2*d^3*x*e + c
*d^3*e) + sqrt(-c^2*d*x^2*e + d*e)/(c^2*d^3*x*e + c*d^3*e))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-1)/(c^4*d^3*x^4 + 2*c^3*d^3*x^3 - 2*c*d^3*x - d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}{(cx)})^2}{(d (cx + 1))^{\frac{5}{2}} \sqrt{-e (cx - 1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(5/2)*sqrt(-e*(c*x - 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{(d + c\,d\,x)^{5/2}\,\sqrt{e - c\,e\,x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(1/2)), x)
```

3.564 $\int \frac{(d+cdx)^{5/2}(a+b\textbf{ArcSin}(cx))^2}{(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=918

$$-\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{b^2d^4(1-c^2x^2)^{3/2}\,\mathrm{ArcSi}}{4c(d+cdx)^{3/2}(e-ce}$$

```
[Out] -8*a*b*d^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*b^2*d^4*
(-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/4*b^2*d^4*x*(-c^2*x^2+1
)^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+1/4*b^2*d^4*(-c^2*x^2+1)^(3/2)*arcsin(
c*x)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*b^2*d^4*x*(-c^2*x^2+1)^(3/2)*arcs
in(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/2*b*c*d^4*x^2*(-c^2*x^2+1)^(3/2)
*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*d^4*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*d^4*x*(-c^2*x^2+1)*(a+
b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*d^4*(-c^2*x^2+1)^
(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)
^(3/2)+4*d^4*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e
)^(3/2)+1/2*d^4*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*
x+e)^(3/2)-5/2*d^4*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/
2)/(-c*e*x+e)^(3/2)-16*I*b^2*d^4*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*b*d^4*(-c^2*x^2+1)^
(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2
)/(-c*e*x+e)^(3/2)+16*I*b^2*d^4*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-c^2
*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*d^4*(-c^2*x^2+1)^(3/
2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+32*I*b*d^4*(-c^2*
x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)
^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A]
time = 0.87, antiderivative size = 918, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 19, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.594$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267, 4795, 4723, 327, 222}

$$-\frac{5(1-c^2x^2)^{3/2}(a+b\mathrm{ArcSin}(cx))^3d^4}{2bc(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{b^2x(1-c^2x^2)^2d^4}{4(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8b^2(1-c^2x^2)^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{x(1-c^2x^2)^2(a+b\mathrm{ArcSin}(cx))^2d^4}{2(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{4(1-c^2x^2)^2(a+b\mathrm{ArcSin}(cx))^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8i(1-c^2x^2)^{3/2}(a+b\mathrm{ArcSin}(cx))^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{8x(1-c^2x^2)(a+b\mathrm{ArcSin}(cx))^2d^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{8(1-c^2x^2)(a+b\mathrm{ArcSin}(cx))^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8abx(1-c^2x^2)^{3/2}d^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8b^2x(1-c^2x^2)^{3/2}\mathrm{ArcSin}(cx)d^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{b^2(1-c^2x^2)^{3/2}\mathrm{ArcSin}(cx)d^4}{4c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{bcx^2(1-c^2x^2)^{3/2}(a+b\mathrm{ArcSin}(cx))d^4}{2(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{32ib(1-c^2x^2)^{3/2}(a+b\mathrm{ArcSin}(cx))\mathrm{ArcTan}\left(e^{i\mathrm{ArcSin}(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{16b(1-c^2x^2)^{3/2}(a+b\mathrm{ArcSin}(cx))\log\left(1+e^{2i\mathrm{ArcSin}(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{16ib^2(1-c^2x^2)^{3/2}\mathrm{Li}_2\left(-ie^{i\mathrm{ArcSin}(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{16ib^2(1-c^2x^2)^{3/2}\mathrm{Li}_2\left(ie^{i\mathrm{ArcSin}(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8ib^2(1-c^2x^2)^{3/2}\mathrm{Li}_2\left(-e^{2i\mathrm{ArcSin}(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (-8*a*b*d^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(8*b^2*d^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*
d^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*d^4*(
1 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
 (8*b^2*d^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*
```

```
x)^(3/2)) - (b*c*d^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*d^4*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
 (4*d^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) + (d^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^
(3/2)*(e - c*e*x)^(3/2)) - (5*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3
)/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((32*I)*b*d^4*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) + (16*b*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*
I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyL
og[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I
)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx = \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{8\left(d^4+cd^4x\right)\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{3/2}} - \frac{7d^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \frac{4cd^4x(a+b}{\sqrt{1-}}\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(8(1-c^2x^2)^{3/2}\right)\int \frac{\left(d^4+cd^4x\right)\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(7d^4(1-c^2x^2)^{3/2}\right)\int}{(d+cdx)^{3/2}(e}$$

$$= \frac{4d^4(1-c^2x^2)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x(1-c^2x^2)^2\left(a+b\sin^{-1}(cx)\right)^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{2(d+cdx)^{3/2}(e-cex)^{3/2}} +$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4x(1-}{(d+cdx}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(}{4(d+cdx)}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(}{4(d+cdx)}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(}{4(d+cdx)}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(}{4(d+cdx)}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(}{4(d+cdx)}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2041 vs. 2(918) = 1836.
time = 11.01, size = 2041, normalized size = 2.22

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((4*a^2*d^2)/e^2 + (a^2*c*d^2*x)/(
2*e^2) - (8*a^2*d^2)/(e^2*(-1 + c*x))))/c + (15*a^2*d^(5/2)*ArcTan[(c*x*Sqr
t[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x)
)])/(2*c*e^(3/2)) - (a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt
[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x]
 - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSi
n[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2
]))/(c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (
4*a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2
))]*(Cos[ArcSin[c*x]/2]*(-(c*x) + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] - ArcSin[c*x]^2 + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + (c
*x + 2*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 4*Log[
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[
(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) - (b^2*d^2*(1 + c*x
)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-18*I)*Pi*Ar
cSin[c*x] - (6 - 6*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)
*ArcSin[c*x])] + 12*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 24*
Pi*Log[Cos[ArcSin[c*x]/2]] - 12*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*
I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2
])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])))/(3*c*e^2*Sqrt[(-d - c*d*x)*(
e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)
 - (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^
2))]*((96*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - ((48 - 48*I)*ArcSin[c*x]^2)/
Sqrt[1 - c^2*x^2] + (20*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] - 48*(-2 + ArcSin[
c*x]^2) - 6*c*x*(-1 + 2*ArcSin[c*x]^2) - (6*ArcSin[c*x]*Cos[2*ArcSin[c*x]])
/Sqrt[1 - c^2*x^2] + (48*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcS
in[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[
Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (96*ArcSin[c*x]^2*Sin[Ar
cSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]))
))/(24*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSi
n[c*x]/2])^2) - (2*b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-
(d*e*(1 - c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - 3*ArcSin[
c*x]^2 - ((6 - 6*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (2*ArcSin[c*x]^3)/Sq
rt[1 - c^2*x^2] + (6*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c
*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[
ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (12*ArcSin[c*x]^2*Sin[ArcSin
[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]))))/(
3*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2])^2) + (a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1
 - c^2*x^2))]*((-15 + 14*ArcSin[c*x])*Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSi
n[c*x])/2] + 2*ArcSin[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(16
```

```
+ 48*ArcSin[c*x] - 20*ArcSin[c*x]^2 + 64*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]]) - 16*Sin[ArcSin[c*x]/2] + 48*ArcSin[c*x]*Sin[ArcSin[c*x]/2] + 2
0*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] - 64*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin
[c*x]/2]]*Sin[ArcSin[c*x]/2] - 15*Sin[(3*ArcSin[c*x])/2] - 14*ArcSin[c*x]*S
in[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2] + 2*ArcSin[c*x]*Sin[(5*ArcSi
n[c*x])/2]))/(8*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2])^2)
```

Maple [F]
time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{5}{2}}(a+b\arcsin(cx))^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] -1/2*(c^2*d^3*x^3*e^(-1)/sqrt(-c^2*d*x^2*e + d*e) + 8*c*d^3*x^2*e^(-1)/sqrt
(-c^2*d*x^2*e + d*e) - 17*d^3*x*e^(-1)/sqrt(-c^2*d*x^2*e + d*e) + 15*d^(5/2
)*arcsin(c*x)*e^(-3/2)/c - 24*d^3*e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*c))*a^2
+ sqrt(d)*e^(1/2)*integrate(((b^2*c^2*d^2*x^2 + 2*b^2*c*d^2*x + b^2*d^2)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d
^2*x + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*s
qrt(-c*x + 1)/(c^2*x^2*e^2 - 2*c*x*e^2 + e^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2*
b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x +
 a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)*e^(-2)/(c^2*x^2 -
 2*c*x + 1), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6189 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}}{(e-c\,e\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(3/2), x)
```

3.565 $\int \frac{(d+cdx)^{3/2}(a+b\text{ArcSin}(cx))^2}{(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=713

$$-\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{2b^2d^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{2b^2d^3x(1-c^2x^2)^{3/2}\,\text{ArcSin}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{4d^3(1-c^2x^2)\,(a+}{c(d+cdx)^{3/2}(e}$$

```
[Out] -2*a*b*d^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*b^2*d^3*
(-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*b^2*d^3*x*(-c^2*x^2+1)^
(3/2)*arcsin(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*d^3*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*d^3*x*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*d^3*(-c^2*x^2+1)^(3/2)
*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+d^3*(-c^2*x^2+1)^2*
(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-d^3*(-c^2*x^2+1)^(3/
2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*I*b*d^3*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+
d)^(3/2)/(-c*e*x+e)^(3/2)+8*b*d^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*d
^3*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^
(3/2)/(-c*e*x+e)^(3/2)+8*I*b^2*d^3*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b^2*d^3*(-c^2*x^2
+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*
x+e)^(3/2)
```

Rubi [A]
time = 0.72, antiderivative size = 713, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.469$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267}

$$\frac{16ibd^3(1-c^2x^2)^{3/2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{d^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^3}{bc(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{d^3(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4id^3(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4d^3x(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4d^3(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{8bd^3(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2abd^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{8ib^2d^3(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{8ib^2d^3(1-c^2x^2)^{3/2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2d^3(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2b^2d^3x(1-c^2x^2)^{3/2}\,\text{ArcSin}(cx)}{(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2b^2d^3(1-c^2x^2)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (-2*a*b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(2*b^2*d^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (2*b^
2*d^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) + (4*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) + (4*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a +
b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^3*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

```
+ ((16*I)*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[
c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E
^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b^2*d^3
*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) - ((4*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^3\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{4\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}} - \frac{3d^3\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} - \frac{cd^3x(a+b\ldots}{\sqrt{1-\ldots}}\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(4\left(1-c^2x^2\right)^{3/2}\right)\int \frac{\left(d^3+cd^3x\right)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(3d^3\left(1-c^2x^2\right)^{3/2}\right)\int \ldots}{(d+cdx)^{3/2}(e\ldots}$$

$$= \frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3\left(1-c^2x^2\right)^2\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1\ldots}{b\ldots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x\left(1-c^2x^2\right)^{3/2}\sin^{-1}(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3(1-\ldots}{c(d\ldots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-\ldots}{(d+cdx\ldots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-\ldots}{(d+cdx\ldots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-\ldots}{(d+cdx\ldots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-\ldots}{(d+cdx\ldots}$$

$$= -\frac{2abd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3\left(1-c^2x^2\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-\ldots}{(d+cdx\ldots}$$

Mathematica [A]
time = 8.84, size = 1255, normalized size = 1.76

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((a^2*d)/e^2 - (4*a^2*d)/(e^2*(-1
+ c*x))))/c + (3*a^2*d^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 +
c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*e^(3/2)) - (a*b*d*(1 + c
*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[
c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2]
- Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[(-d - c*d*x)*(e - c
*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*a*b*d*(1 + c*x)*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-(c*x) + 2*A
rcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]^2 + 4*Log[Cos[ArcS
in[c*x]/2] - Sin[ArcSin[c*x]/2]]) + (c*x + 2*ArcSin[c*x] - Sqrt[1 - c^2*x^2
]*ArcSin[c*x] + ArcSin[c*x]^2 - 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^
2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2])^2) - (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[
-(d*e*(1 - c^2*x^2))]*((-18*I)*Pi*ArcSin[c*x] - (6 - 6*I)*ArcSin[c*x]^2 + A
rcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 12*(Pi - 2*ArcSin[c*x]
)*Log[1 + I*E^(I*ArcSin[c*x])] + 24*Pi*Log[Cos[ArcSin[c*x]/2]] - 12*Pi*Log[
-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] -
 (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2])))/(3*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2])^2) - (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^
2*x^2] - 3*ArcSin[c*x]^2 - ((6 - 6*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (2
*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + (6*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1
+ E^((-I)*ArcSin[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x]
)] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
+ (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (12*ArcSin
[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]))))/(3*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2
] + Sin[ArcSin[c*x]/2])^2)
```

Maple [**F**]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Maxima [**F**]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] -(3*d^(3/2)*arcsin(c*x)*e^(-3/2)/c + (-c^2*d*x^2*e + d*e)^(3/2)/(c^3*x^2*e^
3 - 2*c^2*x*e^3 + c*e^3) + 6*sqrt(-c^2*d*x^2*e + d*e)*d/(c^2*x*e^2 - c*e^2)
)*a^2 + sqrt(d)*e^(1/2)*integrate(((b^2*c*d*x + b^2*d)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c*d*x + a*b*d)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*x^2*e^2 - 2*c*x*e^2 + e
^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c*
d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)*e^(-2)/(c^2*x^
2 - 2*c*x + 1), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}}{(e-c\,e\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(3/2),x)
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(3/2), x)
```

3.566 $\int \frac{\sqrt{d+cdx}\,(a+b\mathbf{ArcSin}(cx))^2}{(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=530

$$\frac{2d^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2d^2x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{2id^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] 2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2
*d^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*
I*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(
3/2)-1/3*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-c
*e*x+e)^(3/2)+8*I*b*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*b*d^2*(-c^2*x^2+1)^
(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2
)/(-c*e*x+e)^(3/2)-4*I*b^2*d^2*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2
*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*I*b^2*d^2*(-c^2*x^2+1)
^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)
^(3/2)-2*I*b^2*d^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))
^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A]
time = 0.63, antiderivative size = 530, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737}

$$\frac{8ibd^2(1-c^2x^2)^{3/2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{d^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^3}{3bc(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2id^2(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2d^2(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2d^2x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4bd^2(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{4ib^2d^2(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{4ib^2d^2(1-c^2x^2)^{3/2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2d^2(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x
)^(3/2)) + (2*d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) - ((2*I)*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*
ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b*d^2*
(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) - ((4*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b^2*d^2*(1 - c^2*x^2)^(
3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - ((2*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sqrt{d+cdx}\,(a+b\sin^{-1}(cx))^2}{(e-cex)^{3/2}}\,dx &= \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^2(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{2(d^2+cd^2x)(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{d^2(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{\left(2(1-c^2x^2)^{3/2}\right)\int \frac{(d^2+cd^2x)(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(d^2(1-c^2x^2)^{3/2}\right)\int \frac{(a}{\sqrt{}}}{(d+cdx)^{3/2}(e-} \\
&= -\frac{d^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2(1-c^2x^2)^{3/2}\right)\int \left(\frac{d^2(a+b\sin^{-1}}{(1-c^2x^2)^{3}}\right.}{(d+cdx)^{3/2}(} \\
&= -\frac{d^2(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2d^2(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\sin^{-1}(}{(1-c^2x^2)^{3}}}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{2d^2(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{2d^2(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{2d^2(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{2d^2(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{2d^2(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{2d^2(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

Mathematica [A]
time = 3.83, size = 513, normalized size = 0.97

$$
-\frac{\frac{6a^2\sqrt{d+cdx}\sqrt{e-cex}}{-1+cx} - 3a^2\sqrt{d}\sqrt{e}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right) + \frac{3ab(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\left((-4+\mathrm{ArcSin}(cx))\mathrm{ArcSin}(cx)-8\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)\right)-\left(\mathrm{ArcSin}(cx)(4+\mathrm{ArcSin}(cx))-8\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)\right)\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)^2} + \frac{b^2(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\left(-18i\pi\,\mathrm{ArcSin}(cx)-(6-6i)\mathrm{ArcSin}(cx)^2+\mathrm{ArcSin}(cx)^3-24\pi\log\left(1+e^{-i\mathrm{ArcSin}(cx)}\right)+12(\pi-2\mathrm{ArcSin}(cx))\log\left(1+ie^{i\mathrm{ArcSin}(cx)}\right)+24\pi\log\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)-12\pi\log\left(-\cos\left(\frac{1}{4}(\pi+2\mathrm{ArcSin}(cx))\right)\right)+24i\,\mathrm{PolyLog}\left(2,-ie^{i\mathrm{ArcSin}(cx)}\right)-\frac{12\mathrm{ArcSin}(cx)^2\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)}{\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)}\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\mathrm{ArcSin}(cx)\right)\right)^2}}{3ce^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

[Out] -1/3*((6*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(-1 + c*x) - 3*a^2*Sqrt[d]*Sqrt[e]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + (3*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-18*I)*Pi*ArcSin[c*x] - (6 - 6*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 12*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 24*Pi*Log[Cos[ArcSin[c*x]/2]] - 12*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2))/(c*e^2)

Maple [F]
time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{cdx+d}\,\left(a+b\arcsin\left(cx\right)\right)^{2}}{\left(-cex+e\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)

[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm="maxima")

[Out] -(sqrt(d)*arcsin(c*x)*e^(-3/2)/c + 2*sqrt(-c^2*d*x^2*e + d*e)/(c^2*x*e^2 - c*e^2))*a^2 + sqrt(d)*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*x^2*e^2 - 2*c*x*e^2 + e^2), x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)*e^(-2)/(c^2*x^2 - 2*c*x + 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^{2}}{\left(-e\left(cx-1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))**2/(-e*(c*x - 1))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d+c\,d\,x}}{{\left(e-c\,e\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(3/2), x)
```

3.567 $\int \frac{(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=454

$$\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{id(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{4iba}{}$$

```
[Out] d*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+d*x*(
-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*d*(-c^2*
x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*I*b*d
*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c
*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*l
n(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*I*b^
2*d*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)
^(3/2)/(-c*e*x+e)^(3/2)+2*I*b^2*d*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*d*(-c^2*x^2+1)^(
3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^
(3/2)
```

Rubi [A]
time = 0.46, antiderivative size = 454, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {4763, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266}

$$\frac{4ibd(1-c^2x^2)^{3/2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{id(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{d(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{dx(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2bd(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2d(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```

```
[Out] (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) - (I*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c
*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((2*I)*b^2*d*(1 - c^2*x^2)^(3/
2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) + ((2*I)*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog
[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{d+cdx}\,(e-cex)^{3/2}}\,dx = \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{d(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}} + \frac{cdx(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(d(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(cd(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,d}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bd(1\right.}{(d}$$

$$= \frac{d(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bd(1\right.}{}$$

$$= \frac{d(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c}{c(d}$$

$$= \frac{d(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c}{c(d}$$

$$= \frac{d(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c}{c(d}$$

$$= \frac{d(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c}{c(d}$$

Mathematica [A]
time = 1.07, size = 221, normalized size = 0.49

$$-\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a\left(a+acx+4b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)\right)-4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2\left(-i+\tan\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+2b\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\left(2b\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+a\tan\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)\right)}{cde^2(-1+cx)(1+cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a*(a + a*c*x + 4*b*Sqrt[1 - c^2*x^2]*Lo
g[Cos[(Pi + 2*ArcSin[c*x])/4]]) - (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])] + b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*(-I + Tan[(Pi +
 2*ArcSin[c*x])/4]) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(2*b*Log[1 + I*E^(I
*ArcSin[c*x])] + a*Tan[(Pi + 2*ArcSin[c*x])/4])))/(c*d*e^2*(-1 + c*x)*(1 +
c*x)))
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] -b^2*e^(-1/2)*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c*x*
e - e)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) - 2*sqrt(-c^2*d*x^2*e + d*
e)*a*b*arcsin(c*x)/(c^2*d*x*e^2 - c*d*e^2) + 2*a*b*e^(-3/2)*log(c*x - 1)/(c
*sqrt(d)) - sqrt(-c^2*d*x^2*e + d*e)*a^2/(c^2*d*x*e^2 - c*d*e^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)*e^(-2)/(c^3*d*x^3 - c^2*d*x^2 - c*d*x + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{asin}(cx))^2}{\sqrt{d(cx+1)}\,(-e(cx-1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(3/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(3/2)), x)
```

3.568 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=217

$$\frac{x(1-c^2x^2)\left(a+b\text{ArcSin}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{i(1-c^2x^2)^{3/2}\left(a+b\text{ArcSin}(cx)\right)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2b(1-c^2x^2)^{3/2}\left(a+b\text{ArcSin}(cx)\right)\log\left(1\right.}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*(-
c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*
d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A]
time = 0.26, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.219$, Rules used = {4763, 4745, 4765, 3800, 2221, 2317, 2438}

$$-\frac{i(1-c^2x^2)^{3/2}\left(a+b\text{ArcSin}(cx)\right)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{x(1-c^2x^2)\left(a+b\text{ArcSin}(cx)\right)^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)\left(a+b\text{ArcSin}(cx)\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2(1-c^2x^2)^{3/2}\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{(1-c^2x^2)^{3/2}\int \frac{(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bc(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\sin^{-1}(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\right.}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4ib(1\right.}{}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-}{}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-}{}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-}{}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 550 vs. 2(217) = 434.
time = 0.72, size = 550, normalized size = 2.53

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a^2*c*x + 2*a*b*c*x*ArcSin[c*x] + (2*I)*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + b^2*c*x*ArcSin[c*x]^2 - I*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 4*b^2*
Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^
2]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*
x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 4
*b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2
]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
```

```
)] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d*e*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b \arcsin \left(c x\right)\right)^{2}}{\left(c d x+d\right)^{\frac{3}{2}} \left(-c e x+e\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] 2*a*b*x*arcsin(c*x)*e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d) - b^2*e^(-1/2)*inte
grate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*x^2*e - d*e)*sqr
t(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + a^2*x*e^(-1)/(sqrt(-c^2*d*x^2*e +
d*e)*d) - a*b*e^(-3/2)*log(x^2 - 1/c^2)/(c*d^(3/2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)*e^(-2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \operatorname{asin}{\left(c x \right)}\right)^{2}}{\left(d \left(c x + 1\right)\right)^{\frac{3}{2}} \left(- e \left(c x - 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2)),
 x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.569 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=709

$$-\frac{b^2e(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{b^2ex(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{be(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{bex(1-c^2x^{2}}{3(d+cd}$$

```
[Out] -1/3*b^2*e*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*b^2*e*x*(-
c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*e*(-c^2*x^2+1)^(3/2)*(a
+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*b*e*x*(-c^2*x^2+1)^(
3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*e*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*e*x*(-c^2*x^2+1)
*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*e*x*(-c^2*x^2+1)^
2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*e*(-c^2*x^2+1)
^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b*e*(-c
^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x
+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b*e*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(
1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*I*b^
2*e*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)
^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2*e*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*e*(-c^2*x^
2+1)^(5/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e
*x+e)^(5/2)
```

Rubi [A]
time = 0.58, antiderivative size = 709, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 14, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267}

$$-\frac{2ibe(1-c^2x^2)^{5/2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ie(1-c^2x^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2ex(1-c^2x^2)^2\,(a+b\text{ArcSin}(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{be(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{bex(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{e(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ex(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{4be(1-c^2x^2)^{5/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ib^2e(1-c^2x^2)^{5/2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{ib^2e(1-c^2x^2)^{5/2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2e(1-c^2x^2)^{5/2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{b^2e(1-c^2x^2)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{b^2ex(1-c^2x^2)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] -1/3*(b^2*e*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2
*e*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*e*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) + (b*e*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)) - (e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d
 + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*e*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c
*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*e*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((
```

```
(2*I)/3)*b*e*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x
])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*e*(1 - c^2*x^2)^(5/2)*(
a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(
e - c*e*x)^(5/2)) + ((I/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*A
rcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e*(1 - c
^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*
e*x)^(5/2)) - (((2*I)/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*Arc
Sin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(e-cex)\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{e\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}} - \frac{cex\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(ce\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\left(1-c^2x^2\right)^{5/2}}}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{e(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ex(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \Big(2e($$

$$= -\frac{be\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{bex\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}} -$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^3}{3c(d+cdx}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^3}{3c(d+cdx}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^3}{3c(d+cdx}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^3}{3c(d+cdx}$$

$$= -\frac{b^2e\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be\left(1-c^2x^2\right)^3}{3c(d+cdx}$$

Mathematica [A]
time = 7.38, size = 739, normalized size = 1.04

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-1/4*a^2/(d^3*e^2*(-1 + c*x)) - a
^2/(6*d^3*e^2*(1 + c*x)^2) - (5*a^2)/(12*d^3*e^2*(1 + c*x))))/c + (a*b*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]*(-2*c*x + Cos[2*ArcSin[c*x]]) -
Sqrt[1 - c^2*x^2]*(-1 + 3*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 5*
```

```
Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + c*x*(3*Log[Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2]] + 5*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])))
)/(3*c*d^2*e*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*Sqrt[1 - c^2*x^2]*((-7*I)*Pi*ArcSin[c*x] + (1 + 4*I)*ArcSin[c*x]^2 - 1
6*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 5*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*
ArcSin[c*x])] + 3*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 16*Pi
*Log[Cos[ArcSin[c*x]/2]] - 3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 5*Pi*Lo
g[Sin[(Pi + 2*ArcSin[c*x])/4]] + (6*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
 (10*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] - (3*ArcSin[c*x]^2*Sin[ArcSin[c*x]/
2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (2*ArcSin[c*x]^2*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (ArcSin[c*x]*(2 + A
rcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - ((4 + 5*ArcSin[c
*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(6*c
*d^2*e*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 - c^2*x^2))])
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] -1/6*a*b*c*(2*sqrt(d)*e^(1/2)/(c^3*d^3*x*e^2 + c^2*d^3*e^2) - 5*e^(-3/2)*lo
g(c*x + 1)/(c^2*d^(5/2)) - 3*e^(-3/2)*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b
*(2*x*e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d^2) - 1/(sqrt(-c^2*d*x^2*e + d*e)*c
^2*d^2*x*e + sqrt(-c^2*d*x^2*e + d*e)*c*d^2*e))*arcsin(c*x) - b^2*e^(-1/2)*
integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^3*d^2*x^3*e + c^
2*d^2*x^2*e - c*d^2*x*e - d^2*e)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
+ 1/3*a^2*(2*x*e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d^2) - 1/(sqrt(-c^2*d*x^2*e
 + d*e)*c^2*d^2*x*e + sqrt(-c^2*d*x^2*e + d*e)*c*d^2*e))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)*e^(-2)/(c^5*d^3*x^5 + c^4*d^3*x^4 - 2*c^3*d^3*x^3 - 2*c^2*d^
3*x^2 + c*d^3*x + d^3), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3005 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{5/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)), x)
```

3.570 $\int \frac{(d+cdx)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}{(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=730

$$\frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^5x(1-c^2x^2)^{5/2}\,\mathrm{ArcSin}(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{28id^5(1-c^2x^2)^{5/2}\,(a}{3c(d+cdx)^{5/2}(}$$

```
[Out] 2*a*b*d^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2*b^2*d^5*(
-c^2*x^2+1)^3/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2*b^2*d^5*x*(-c^2*x^2+1)^(
5/2)*arcsin(c*x)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-28/3*I*d^5*(-c^2*x^2+1)^(
5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-d^5*(-c^2*x^2+1
)^3*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+5/3*d^5*(-c^2*x^
2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-112/3*b
*d^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^2*x^2+1)^(1/2))
)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-112/3*I*b^2*d^5*(-c^2*x^2+1)^(5/2)*pol
ylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-8/3
*b*d^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*sec(1/4*Pi+1/2*arcsin(c*x))^2/c
/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+16/3*b^2*d^5*(-c^2*x^2+1)^(5/2)*tan(1/4*P
i+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-28/3*d^5*(-c^2*x^2+1)
^(5/2)*(a+b*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)+4/3*d^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*sec(1/4*Pi+1/
2*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(
5/2)
```

Rubi [A]
time = 0.91, antiderivative size = 730, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 16, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4763, 4859, 4737, 4767, 4715, 267, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (2*a*b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (
2*b^2*d^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b^2
*d^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (((28*I)/3)*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/
(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*d^5*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*d^5*(
1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(
d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((112*I)/3)*b^2*d^5*(1 - c^2*x^2)^(5
```

```
/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (8*b*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]
/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (16*b^2*d^5*(1 - c^2*x^2
)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (28*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x
]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*d^5*(1 - c^2*x^2)^(5/2
)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(d+cdx)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^5\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{5d^5\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{cd^5x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{8d^5\left(a+b\sin^{-1}(\cdots\right.}{(-1+cx)^2\sqrt{1-\cdots}}\cdots\right.}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(5d^5(1-c^2x^2)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8d^5(1-c^2x^2)^{5/2}\right)\int \frac{(a+\cdots}{(-1+cx\cdots}}{(d+cdx)^{5/2}(e-c\cdots}$$

$$= -\frac{d^5(1-c^2x^2)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx\cdots\right.}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}\cdots$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^5(1-c^2x^2)^3\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1\cdots}{3bc\cdots}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c^2x^2)^{5/2}\sin^{-1}(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^5(1-c\cdots}{c(d+\cdots}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c\cdots}{(d+cdx)^{\cdots}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c\cdots}{(d+cdx)^{\cdots}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c\cdots}{(d+cdx)^{\cdots}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c\cdots}{(d+cdx)^{\cdots}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c\cdots}{(d+cdx)^{\cdots}}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2312 vs. 2(730) = 1460.
time = 10.44, size = 2312, normalized size = 3.17

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-((a^2*d^2)/e^3) + (8*a^2*d^2)/(3
*e^3*(-1 + c*x)^2) + (28*a^2*d^2)/(3*e^3*(-1 + c*x))))/c - (5*a^2*d^(5/2)*A
rcTan[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 +
c*x)*(1 + c*x))])/(c*e^(5/2)) + (a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sq
rt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*
x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x]
 + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] + 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*
Sin[ArcSin[c*x]/2]))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) +
(a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[Ar
cSin[c*x]/2]*(-8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]
/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*
ArcSin[c*x])) + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 4
*ArcSin[c*x] - 6*ArcSin[c*x]^2 + 56*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2]] + Sqrt[1 - c^2*x^2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[Ar
cSin[c*x]/2] - Sin[ArcSin[c*x]/2]]))*Sin[ArcSin[c*x]/2]))/(3*c*e^3*Sqrt[(-d
 - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-3*I)*Pi*ArcSin[c*x] + (4*ArcSin[
c*x])/(-1 + c*x) - (1 - I)*ArcSin[c*x]^2 - (2*ArcSin[c*x]^2)/(-1 + c*x) - 4
*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 4*A
rcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*
Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*
x])] + (2*(4 + ArcSin[c*x]^2 + c*x*(-4 + ArcSin[c*x]^2))*Sin[ArcSin[c*x]/2]
)/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3))/(3*c*e^3*Sqrt[(-d - c*d*x)*
(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)
 + (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x
^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*(-2 + ArcSin[c*x])*Ar
cSin[c*x])/((-1 + c*x)*Sqrt[1 - c^2*x^2]) - 3*ArcSin[c*x]^2 - ((13 - 13*I)*
ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (3*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + (1
3*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*(Pi - 2*A
rcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2
*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c
*x])]))/Sqrt[1 - c^2*x^2] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 -
c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3) + (2*(4 - 13*ArcSin[c
*x]^2)*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2]))))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2]
 + Sin[ArcSin[c*x]/2])^2) + (2*b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-21*I)*Pi*ArcSin[c*x] - (2*(-2 + ArcSin[
c*x])*ArcSin[c*x])/(-1 + c*x) - (7 - 7*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 2
8*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I
*ArcSin[c*x])] + 28*Pi*Log[Cos[ArcSin[c*x]/2]] - 14*Pi*Log[-Cos[(Pi + 2*Arc
Sin[c*x])/4]] + (28*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^
```

```
2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (2*(4 -
 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]
/2])))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(3*Cos[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Cos
[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(-20 - 24*ArcSin[c*x] + 27*ArcSin[
c*x]^2 - 156*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[
c*x])/2]*(9 - 35*ArcSin[c*x] - 9*ArcSin[c*x]^2 + 52*Log[Cos[ArcSin[c*x]/2]
- Sin[ArcSin[c*x]/2]]) + 20*Sin[ArcSin[c*x]/2] - 24*ArcSin[c*x]*Sin[ArcSin[
c*x]/2] - 27*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] + 156*Log[Cos[ArcSin[c*x]/2]
- Sin[ArcSin[c*x]/2]]*Sin[ArcSin[c*x]/2] + 9*Sin[(3*ArcSin[c*x])/2] + 35*Ar
cSin[c*x]*Sin[(3*ArcSin[c*x])/2] - 9*ArcSin[c*x]^2*Sin[(3*ArcSin[c*x])/2] +
 52*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[(3*ArcSin[c*x])/2] - 3
*Sin[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Sin[(5*ArcSin[c*x])/2]))/(6*c*e^3*S
qrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{5}{2}} (a+b\arcsin(cx))^2}{(-cex+e)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
[Out] 1/3*(15*d^(5/2)*arcsin(c*x)*e^(-5/2)/c - 3*(-c^2*d*x^2*e + d*e)^(5/2)/(c^5*
x^4*e^5 - 4*c^4*x^3*e^5 + 6*c^3*x^2*e^5 - 4*c^2*x*e^5 + c*e^5) - 5*(-c^2*d*
x^2*e + d*e)^(3/2)*d/(c^4*x^3*e^4 - 3*c^3*x^2*e^4 + 3*c^2*x*e^4 - c*e^4) +
10*sqrt(-c^2*d*x^2*e + d*e)*d^2/(c^3*x^2*e^3 - 2*c^2*x*e^3 + c*e^3) + 35*sq
rt(-c^2*d*x^2*e + d*e)*d^2/(c^2*x*e^3 - c*e^3))*a^2 - sqrt(d)*e^(1/2)*integ
rate(((b^2*c^2*d^2*x^2 + 2*b^2*c*d^2*x + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x + a*b*d^2)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^3*x^3*
e^3 - 3*c^2*x^2*e^3 + 3*c*x*e^3 - e^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x
+ a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)*e^(-3)/(c^3*x^3
- 3*c^2*x^2 + 3*c*x - 1), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6189 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}}{(e-c\,e\,x)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(5/2), x)
```

3.571 $\int \frac{(d+cdx)^{3/2}(a+b\textbf{ArcSin}(cx))^2}{(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=544

$$-\frac{8id^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{32bd^4(1-c^2x^2)^{5/2}(a+b\text{ArcSi}}{3c(d+cdx)^{5/2}}$$

```
[Out] -8/3*I*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x
+e)^(5/2)+1/3*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2
)/(-c*e*x+e)^(5/2)-32/3*b*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I/(
I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-32/3*I*b^2*d^
4*(-c^2*x^2+1)^(5/2)*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5
/2)/(-c*e*x+e)^(5/2)-4/3*b*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*sec(1/4
*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+8/3*b^2*d^4*(-c^2
*x^2+1)^(5/2)*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2
)-8/3*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x)
)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin
(c*x))^2*sec(1/4*Pi+1/2*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x
+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A]

time = 0.77, antiderivative size = 544, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4859, 4737, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\frac{d^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{8id^4(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{32bd^4(1-c^2x^2)^{5/2}\log\left(1-ie^{-i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{8d^4(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4bd^4(1-c^2x^2)^{5/2}\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2d^4(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{32ib^2d^4(1-c^2x^2)^{5/2}\text{Li}_2\left(ie^{-i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{8b^2d^4(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (((-8*I)/3)*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2)) + (d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(
3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (32*b*d^4*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)) - (((32*I)/3)*b^2*d^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(
I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*d^4*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*b^2*d^4*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + Ar
cSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*d^4*(1 - c^2*x
^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^
2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{(e-cex)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^4\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{d^4\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}} + \frac{4d^4\left(a+b\sin^{-1}(cx)\right)^2}{(-1+cx)^2\sqrt{1-c^2x^2}} + \frac{4d^4(a+b\sin}{(-1+cx)\sqrt{1}}\right.}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^4(1-c^2x^2)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4d^4(1-c^2x^2)^{5/2}\right)\int \frac{(a+}{(-1+cx}}{(d+cdx)^{5/2}(e-c}$$

$$= \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(}{-c}\right.}{(d+cdx)^{5/2}(e-}$$

$$= \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+\right.}{c(d+cdx)}$$

$$= \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4bd^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(\right.}{3c(d+cdx)^{5/2}(}$$

$$= -\frac{4id^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}\right.}{3bc(d+cdx)^{5/2}(e-cex}$$

$$= -\frac{8id^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}\right.}{3bc(d+cdx)^{5/2}(e-cex}$$

$$= -\frac{8id^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}\right.}{3bc(d+cdx)^{5/2}(e-cex}$$

$$= -\frac{8id^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}\right.}{3bc(d+cdx)^{5/2}(e-cex}$$

$$= -\frac{8id^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\left(a+b\sin^{-1}\right.}{3bc(d+cdx)^{5/2}(e-cex}$$

Mathematica [B] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1419 vs. $2(544) = 1088$.
time = 8.50, size = 1419, normalized size = 2.61

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((4*a^2*d)/(3*e^3*(-1 + c*x)^2) +
(8*a^2*d)/(3*e^3*(-1 + c*x))))/c - (a^2*d^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 +
c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*e^(5/
2)) + (a*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Co
s[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*Sqrt[1 - c^2*x^2]
*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*e^
3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^
4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (a*b*d*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-8 - 6*ArcSin[c*
x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + C
os[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*ArcSin[c*x])) + 28*Log[Cos[Arc
Sin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 4*ArcSin[c*x] - 6*ArcSin[c*x]^2
 + 56*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*((14
 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]
/2]]))*Sin[ArcSin[c*x]/2]))/(6*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[Ar
cSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2])) + (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2
*x^2))]*((-3*I)*Pi*ArcSin[c*x] + (4*ArcSin[c*x])/(-1 + c*x) - (1 - I)*ArcSi
n[c*x]^2 - (2*ArcSin[c*x]^2)/(-1 + c*x) - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])
] + 2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin
[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])
/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*(4 + ArcSin[c*x]^2 + c
*x*(-4 + ArcSin[c*x]^2))*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2])^3))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*d*(1 + c*x)*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-21*I)*Pi*ArcSin[c*x] - (2
*(-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) - (7 - 7*I)*ArcSin[c*x]^2 + Arc
Sin[c*x]^3 - 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi - 2*ArcSin[c*x])*
Log[1 + I*E^(I*ArcSin[c*x])] + 28*Pi*Log[Cos[ArcSin[c*x]/2]] - 14*Pi*Log[-C
os[(Pi + 2*ArcSin[c*x])/4]] + (28*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (
4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
])^3 + (2*(4 - 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - S
in[ArcSin[c*x]/2])))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x
^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{3}{2}}\,(a+b\arcsin{(cx)})^2}{(-cex+e)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] 1/3*(3*d^(3/2)*arcsin(c*x)*e^(-5/2)/c - (-c^2*d*x^2*e + d*e)^(3/2)/(c^4*x^3
*e^4 - 3*c^3*x^2*e^4 + 3*c^2*x*e^4 - c*e^4) + 2*sqrt(-c^2*d*x^2*e + d*e)*d/
(c^3*x^2*e^3 - 2*c^2*x*e^3 + c*e^3) + 7*sqrt(-c^2*d*x^2*e + d*e)*d/(c^2*x*e
^3 - c*e^3))*a^2 - sqrt(d)*e^(1/2)*integrate(((b^2*c*d*x + b^2*d)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c*d*x + a*b*d)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^3*x^3*e^3 - 3*
c^2*x^2*e^3 + 3*c*x*e^3 - e^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c
*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-(c*x - 1)*e)*e^(-3)/(c^3*x
^3 - 3*c^2*x^2 + 3*c*x - 1), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}}{(e-c\,e\,x)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(5/2), x)
```

3.572 $\int \frac{\sqrt{d+cdx}\,(a+b\mathbf{ArcSin}(cx))^2}{(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=486

$$-\frac{id^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4bd^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))\log\left(1-ie^{-i\text{ArcSin}(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{4ib^2d^3(}{}$$

```
[Out] -1/3*I*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x
+e)^(5/2)-4/3*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^
2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-4/3*I*b^2*d^3*(-c^2*x^2
+1)^(5/2)*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x
+e)^(5/2)-2/3*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*sec(1/4*Pi+1/2*arc
sin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b^2*d^3*(-c^2*x^2+1)^(5/
2)*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*d^3*(
-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+
d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*se
c(1/4*Pi+1/2*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(
-c*e*x+e)^(5/2)
```

Rubi [A]

time = 0.72, antiderivative size = 486, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4763, 4859, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$-\frac{id^3(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4bd^3(1-c^2x^2)^{5/2}\log\left(1-ie^{-i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{d^3(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2bd^3(1-c^2x^2)^{5/2}\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{d^3(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)\sec^2\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{4ib^2d^3(1-c^2x^2)^{5/2}\text{Li}_2\left(ie^{-i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{4b^2d^3(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\text{ArcSin}(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] ((-1/3*I)*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/
2)*(e - c*e*x)^(5/2)) - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Lo
g[1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((
4*I)/3)*b^2*d^3*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d
 + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(
5/2)) + (4*b^2*d^3*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
 + (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]
^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\,(a+b\sin^{-1}(cx))^2}{(e-cex)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^3(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{2d^3(a+b\sin^{-1}(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}} + \frac{d^3(a+b\sin^{-1}(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^3(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\sin^{-1}(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2d^3(1-c^2x^2)^{5/2}\right)\int \frac{(\cdots}{(-1+\cdots}}{(d+cdx)^{5/2}(e-\cdots}$$

$$= \frac{\left(d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{-c+c\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2cd^3(1-c^2\cdots\right.}{\cdots}$$

$$= -\frac{\left(d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)dx, x, \sin^{-1}(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}} + \cdots$$

$$= -\frac{2bd^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^3(1-c\cdots}{\cdots}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(c\cdots}{3c(d+cdx)^{5/2}(e\cdots}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin\cdots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5\cdots}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin\cdots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5\cdots}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin\cdots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5\cdots}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\sin^{-1}(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\sin\cdots\right.}{3c(d+cdx)^{5/2}(e-cex)^{5\cdots}}$$

Mathematica [A]
time = 6.01, size = 507, normalized size = 1.04

[illegible]

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((a^2*(1 + c*x))/(-1 + c*x)^2 + (a*b*(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b^2*(1 + c*x)*((-3*I)*Pi*ArcSin[c*x] + (4*ArcSin[c*x])/(-1 + c*x) - (1 - I)*ArcSin[c*x]^2 - (2*ArcSin[c*x]^2)/(-1 + c*x) - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*(4 - 4*c*x + (1 + c*x)*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)))/(3*c*e^3)

Maple [**F**]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{cdx+d}\,\left(a+b\arcsin\left(cx\right)\right)^{2}}{\left(-cex+e\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)

[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm="maxima")

[Out] b^2*sqrt(d)*e^(-1/2)*integrate(sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*x^2*e^2 - 2*c*x*e^2 + e^2)*sqrt(-c*x + 1)), x) + 2/3*a*b*c*(2*sqrt(d)*e^(1/2)/(c^3*x*e^3 - c^2*e^3) - sqrt(d)*e^(-5/2)*log(c*x - 1)/c^2) + 2/3*a*b*(2*sqrt(-c^2*d*x^2*e + d*e)/(c^3*x^2*e^3 - 2*c^2*x*e^3 + c*e^3) + sqrt(-c^2*d*x^2*e + d*e)/(c^2*x*e^3 - c*e^3))*arcsin(c*x) + 1/3*a^2*(2*sqrt(-c^2*d*x^2*e + d*e)/(c^3*x^2*e^3 - 2*c^2*x*e^3 + c*e^3) + sqrt(-c^2*d*x^2*e + d*e)/(c^2*x*e^3 - c*e^3))

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-3)/(c^3*x^3 - 3*c^2*x^2 + 3*c*x - 1), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}}{(e-c\,e\,x)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(5/2), x)
```

3.573 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d+cdx}\,(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=896

$$\frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2d^2(1-c^2x^2)^{5/2}\operatorname{ArcSin}(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{bd^2(1-c^2x^2)^{3/2}(a\ \cdots}{3c(d+cdx)^{5/2}(\cdots}$$

```
[Out] 2/3*b^2*d^2*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b^2*d^2*x
*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b^2*d^2*(-c^2*x^2+1)^(
5/2)*arcsin(c*x)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*d^2*(-c^2*x^2+1)^
(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*b*d^2*x*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*c*d
^2*x^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2
)+2/3*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/
2)+1/3*d^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5
/2)+1/3*c^2*d^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*
x+e)^(5/2)+2/3*d^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c
*e*x+e)^(5/2)+4/3*I*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*arctan(I*c*x
+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2*d^2*(-c^2
*x^2+1)^(5/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)+2/3*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*d^2*(-c^2*x^
2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*I*b^2
*d^2*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)
^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*d^2*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c*
x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A]

time = 0.82, antiderivative size = 896, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 18, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.562$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267, 4771, 4791, 294, 222}

$$\frac{c^2d^2(1-c^2x^2)(a+b\operatorname{ArcSin}(cx))^2x^3}{3(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{bcd^2(1-c^2x^2)^{3/2}(a+b\operatorname{ArcSin}(cx))x^2}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2(1-c^2x^2)^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2d^2(1-c^2x^2)^2(a+b\operatorname{ArcSin}(cx))^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{d^2(1-c^2x^2)(a+b\operatorname{ArcSin}(cx))^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{2bd^2(1-c^2x^2)^{3/2}(a+b\operatorname{ArcSin}(cx))x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2(1-c^2x^2)^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{id^2(1-c^2x^2)^{5/2}(a+b\operatorname{ArcSin}(cx))^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2d^2(1-c^2x^2)(a+b\operatorname{ArcSin}(cx))^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{b^2d^2(1-c^2x^2)^{5/2}\operatorname{ArcSin}(cx)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{bd^2(1-c^2x^2)^{3/2}(a+b\operatorname{ArcSin}(cx))}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{4ibd^2(1-c^2x^2)^{5/2}(a+b\operatorname{ArcSin}(cx))\operatorname{ArcTan}\left(e^{i\operatorname{ArcSin}(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\operatorname{ArcSin}(cx))\log\left(1+e^{2i\operatorname{ArcSin}(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{Li}_2\left(-ie^{i\operatorname{ArcSin}(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{Li}_2\left(ie^{i\operatorname{ArcSin}(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{ib^2d^2(1-c^2x^2)^{5/2}\operatorname{Li}_2\left(-e^{2i\operatorname{ArcSin}(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

```
[Out] (2*b^2*d^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*
b^2*d^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*d
^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (2*b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(
3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*d^2*x^2*(1 - c^2*x^2)^(3/2)*(
```

```
a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
(d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (c^2*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)
/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*d^2*(1 - c^2*x^2)^(5/2)*(
a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*
b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c
*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c
*e*x)^(5/2)) - (((2*I)/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*I)/3)*b^2*d^2
*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - ((I/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
```

```
[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\,(e-cex)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^2\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{d^2\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}+\frac{2cd^2x\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}+\frac{c^2d^2x^2\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(2cd^2\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right.}{(1-c^2x^2)^{5/2}}}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2d^2\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^2x\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{c^2d^2x}{}$$

$$= -\frac{bd^2\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2bd^2x\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{bd^2\left(1-c^2x^2\right)^{3/2}}{3c(d+cdx)^{5/}}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2d^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2d^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2d^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

$$= \frac{2b^2d^2\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2x\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b^2d^2\left(1-c^2x^2\right)^{5/}}{3c(d+cdx)^{5/2}(e}$$

Mathematica [A]

time = 4.50, size = 388, normalized size = 0.43

$$\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\left(-\frac{2a^2(-2+cx)}{(-1+cx)^2}+\frac{2ab\left(\cos\left(\frac{3}{2}\text{ArcSin}(cx)\right)\left(\text{ArcSin}(cx)-2\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)+\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\left(-2+3\text{ArcSin}(cx)+6\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)+2\left(1-\left(-1+\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)-2\left(2+\sqrt{1-c^2x^2}\right)\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)\right)\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)}{\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)^3}+\frac{b^2\left(-8i\,\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)\left(8\log\left(1+ie^{i\text{ArcSin}(cx)}\right)-2\sec^2\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+4\tan\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)+\text{ArcSin}(cx)^2\left(-2i+\left(2+\sec^2\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)\tan\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)\right)}{\sqrt{1-c^2x^2}}\right)}{6cde^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-2*a^2*(-2 + c*x))/(-1 + c*x)^2 + (2*a*b
*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]]) + Cos[ArcSin[c*x]/2]*(-2 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(1 - (-1 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]
- 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*S
in[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2])^3) + (b^2*((-8*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + ArcSin[c*x]*(8
*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Sec[(Pi + 2*ArcSin[c*x])/4]^2) + 4*Tan[(P
i + 2*ArcSin[c*x])/4] + ArcSin[c*x]^2*(-2*I + (2 + Sec[(Pi + 2*ArcSin[c*x])
/4]^2)*Tan[(Pi + 2*ArcSin[c*x])/4])))/Sqrt[1 - c^2*x^2]))/(6*c*d*e^3)
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,(-cex+e)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] 2/3*a*b*c*(e^(1/2)/(c^3*sqrt(d)*x*e^3 - c^2*sqrt(d)*e^3) + e^(-5/2)*log(c*x
 - 1)/(c^2*sqrt(d))) + 2/3*a*b*(sqrt(-c^2*d*x^2*e + d*e)/(c^3*d*x^2*e^3 - 2
*c^2*d*x*e^3 + c*d*e^3) - sqrt(-c^2*d*x^2*e + d*e)/(c^2*d*x*e^3 - c*d*e^3))
*arcsin(c*x) + b^2*e^(-1/2)*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1))^2/((c^2*x^2*e^2 - 2*c*x*e^2 + e^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/
sqrt(d) + 1/3*a^2*(sqrt(-c^2*d*x^2*e + d*e)/(c^3*d*x^2*e^3 - 2*c^2*d*x*e^3
+ c*d*e^3) - sqrt(-c^2*d*x^2*e + d*e)/(c^2*d*x*e^3 - c*d*e^3))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-3)/(c^4*d*x^4 - 2*c^3*d*x^3 + 2*c*d*x - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{asin}\,(cx))^2}{\sqrt{d\,(cx+1)}\,\left(-e\,(cx-1)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(5/2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))^2}{\sqrt{d + c\,d\,x}\,(e - c\,e\,x)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(5/2)), x)
```

3.574 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=709

$$\frac{b^2d(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{b^2dx(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{bd(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{bdx(1-c^2x^2)^{3/2}}{3(d+cdx)^{5}}$$

```
[Out] 1/3*b^2*d*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*b^2*d*x*(-c
^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*d*(-c^2*x^2+1)^(3/2)*(a+
b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*d*x*(-c^2*x^2+1)^(3
/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*d*(-c^2*x^2+1)*(
a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*d*x*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*d*x*(-c^2*x^2+1)^2
*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*d*(-c^2*x^2+1)^
(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*I*b*d*(-c^
2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+
d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b*d*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2
*d*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^
(5/2)/(-c*e*x+e)^(5/2)+1/3*I*b^2*d*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*d*(-c^2*x^2
+1)^(5/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*
x+e)^(5/2)
```

Rubi [A]
time = 0.58, antiderivative size = 709, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 14, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267}

$$\frac{2ibd(1-c^2x^2)^{5/2}\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2id(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2dx(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{bd(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{bdx(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{3(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{d(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{dx(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{4bd(1-c^2x^2)^{5/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{ib^2d(1-c^2x^2)^{5/2}\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ib^2d(1-c^2x^2)^{5/2}\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2d(1-c^2x^2)^{5/2}\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{b^2d(1-c^2x^2)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{b^2dx(1-c^2x^2)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (b^2*d*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2*d*
x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*d*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
 (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d +
c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]
)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*d*(1 - c^2*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*
```

```
I)/3)*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])]
)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*d*(1 - c^2*x^2)^(5/2)*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) - ((I/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*ArcS
in[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + ((I/3)*b^2*d*(1 - c^2*
x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (((2*I)/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSin
[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int \left(\frac{d\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}+\frac{cdx\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d\left(1-c^2x^2\right)^{5/2}\right)\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(cd\left(1-c^2x^2\right)^{5/2}\right)\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{(1-c^2x^2)^{5/2}}\,d}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{d(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{dx(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2d(1-\right.}{3(}$$

$$= -\frac{bd\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bdx\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \ldots$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}(}{3c(d+cdx)^{5/}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}(}{3c(d+cdx)^{5/}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}(}{3c(d+cdx)^{5/}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}(}{3c(d+cdx)^{5/}}$$

$$= \frac{b^2d\left(1-c^2x^2\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx\left(1-c^2x^2\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd\left(1-c^2x^2\right)^{3/2}(}{3c(d+cdx)^{5/}}$$

Mathematica [A]
time = 7.43, size = 764, normalized size = 1.08

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(a^2/(6*d^2*e^3*(-1 + c*x)^2) - (5
*a^2)/(12*d^2*e^3*(-1 + c*x)) - a^2/(4*d^2*e^3*(1 + c*x))))/c - (a*b*Sqrt[d
 + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(2*ArcSin[c*x]*(2*c*x + Cos[2*A
rcSin[c*x]]) + Sqrt[1 - c^2*x^2]*(-1 + 5*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
```

```
n[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - c*x*(5*Log[Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]]))))/(3*c*d*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 -
c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3*(Cos[ArcSin[c*x]/2]
+ Sin[ArcSin[c*x]/2])) - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*
x^2]*((9*I)*Pi*ArcSin[c*x] - ((-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) +
(1 - 4*I)*ArcSin[c*x]^2 + 16*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 3*(Pi + 2*A
rcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 5*(Pi - 2*ArcSin[c*x])*Log[1 + I
*E^(I*ArcSin[c*x])] - 16*Pi*Log[Cos[ArcSin[c*x]/2]] + 5*Pi*Log[-Cos[(Pi + 2
*ArcSin[c*x])/4]] - 3*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (10*I)*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])] - (6*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (2*Arc
Sin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3
+ ((4 + 5*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]) + (3*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2])))/(6*c*d*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1
 - c^2*x^2))])
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a + b \arcsin{(cx)})^2}{(cdx + d)^{\frac{3}{2}} (-cex + e)^{\frac{5}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] 1/6*a*b*c*(2*sqrt(d)*e^(1/2)/(c^3*d^2*x*e^3 - c^2*d^2*e^3) + 3*e^(-5/2)*log
(c*x + 1)/(c^2*d^(3/2)) + 5*e^(-5/2)*log(c*x - 1)/(c^2*d^(3/2))) + 2/3*a*b*
(2*x*e^(-2)/(sqrt(-c^2*d*x^2*e + d*e)*d) - 1/(sqrt(-c^2*d*x^2*e + d*e)*c^2*
d*x*e^2 - sqrt(-c^2*d*x^2*e + d*e)*c*d*e^2))*arcsin(c*x) + b^2*e^(-1/2)*int
egrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^3*d*x^3*e^2 - c^2*d
*x^2*e^2 - c*d*x*e^2 + d*e^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 1
/3*a^2*(2*x*e^(-2)/(sqrt(-c^2*d*x^2*e + d*e)*d) - 1/(sqrt(-c^2*d*x^2*e + d*
e)*c^2*d*x*e^2 - sqrt(-c^2*d*x^2*e + d*e)*c*d*e^2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-3)/(c^5*d^2*x^5 - c^4*d^2*x^4 - 2*c^3*d^2*x^3 + 2*c^2*d
^2*x^2 + c*d^2*x - d^2), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3005 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)), x)
```

3.575 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx$

Optimal. Leaf size=366

$$\frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{x(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2x(1-c^2x^2}{3(d+c}$$

```
[Out] 1/3*b^2*x*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*(-c^2*x^2+1
)^(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*x*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*x*(-c^2*x^2+1
)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*(-c^2*x^2+1)
^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*(-c^2*x^2+1)^(5/2)*polylog(2,-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A]
time = 0.33, antiderivative size = 366, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {4763, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197}

$$-\frac{2i(1-c^2x^2)^{5/2}(a+b\text{ArcSin}(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2x(1-c^2x^2)^2(a+b\text{ArcSin}(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{b(1-c^2x^2)^{3/2}(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{x(1-c^2x^2)(a+b\text{ArcSin}(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{4b(1-c^2x^2)^{5/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2(1-c^2x^2)^{5/2}\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{b^2x(1-c^2x^2)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (b^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) + (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (((2*I)/3)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*(1 - c^2*x^2)^(5/2)*(a + b*
ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*
e*x)^(5/2)) - (((2*I)/3)*b^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSi
n[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \frac{(1-c^2x^2)^{5/2}\int \frac{(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \ldots$$

$$= -\frac{b(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2)(a+b\sin^{-1}(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2x(1\ldots}{3\ldots}$$

$$= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2\ldots}{3(d+cd\ldots}$$

$$= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2\ldots}{3(d+cd\ldots}$$

$$= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2\ldots}{3(d+cd\ldots}$$

$$= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2\ldots}{3(d+cd\ldots}$$

$$= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\sin^{-1}(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2\ldots}{3(d+cd\ldots}$$

Mathematica [A]

time = 5.90, size = 722, normalized size = 1.97

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (4*a^2*c*x*(3 - 2*c^2*x^2) + b^2*(c*x + 6*c*x*ArcSin[c*x]^2 + (4*I)*Pi*ArcS
in[c*x]*Cos[3*ArcSin[c*x]] - (2*I)*ArcSin[c*x]^2*Cos[3*ArcSin[c*x]] + 8*Pi*
Cos[3*ArcSin[c*x]]*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Cos[3*ArcSin[c*x]]*
Log[1 - I*E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - I*E
^(I*ArcSin[c*x])] - 2*Pi*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] +
4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] - 8*Pi*Cos[3*
ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Cos[3*ArcSin[c*x]]*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] + 2*Sqrt[1 - c^2*x^2]*((-3*I)*ArcSin[c*x]^2 + ArcSin[
c*x]*(-2 + (6*I)*Pi + 6*Log[1 - I*E^(I*ArcSin[c*x])] + 6*Log[1 + I*E^(I*Arc
Sin[c*x])]) + 3*Pi*(4*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin
[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])] - 4*Log[Cos[ArcSin[c*x]/2]] + Log[-C
os[(Pi + 2*ArcSin[c*x])/4]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])) - 2*Pi*Cos
[3*ArcSin[c*x]]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (16*I)*(1 - c^2*x^2)^(3/
2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (16*I)*(1 - c^2*x^2)^(3/2)*PolyLog[
2, I*E^(I*ArcSin[c*x])] + Sin[3*ArcSin[c*x]] + 2*ArcSin[c*x]^2*Sin[3*ArcSin
[c*x]]) + 4*a*b*(Sqrt[1 - c^2*x^2]*(-1 + 2*Log[Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2]] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 2*Cos[2*Arc
Sin[c*x]]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]])) + ArcSin[c*x]*(3*c*x + Sin[3*ArcSin[c*x]])))/
(12*d^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c - c^3*x^2))
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b \arcsin (cx))^2}{(cdx+d)^{\frac{5}{2}}\,(-cex+e)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] 1/3*a*b*c*(e^(1/2)/(c^4*d^(5/2)*x^2*e^3 - c^2*d^(5/2)*e^3) + 2*e^(-5/2)*log
(c*x + 1)/(c^2*d^(5/2)) + 2*e^(-5/2)*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*
(x*e^(-1)/((-c^2*d*x^2*e + d*e)^(3/2)*d) + 2*x*e^(-2)/(sqrt(-c^2*d*x^2*e +
d*e)*d^2))*arcsin(c*x) + b^2*e^(-1/2)*integrate(arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2/((c^4*d^2*x^4*e^2 - 2*c^2*d^2*x^2*e^2 + d^2*e^2)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 1/3*a^2*(x*e^(-1)/((-c^2*d*x^2*e + d*e)
^(3/2)*d) + 2*x*e^(-2)/(sqrt(-c^2*d*x^2*e + d*e)*d^2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-3)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3),
 x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6190 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d+c\,d\,x\right)}^{5/2}\,{\left(e-c\,e\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x)
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)), x)
```

3.576 $\int x^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=351

$$\frac{b^2x\sqrt{d+cdx}\,\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{bx^2\sqrt{d+cdx}}{}$$

```
[Out] 1/64*b^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2-1/32*b^2*x^3*(c*d*x+d)^(1/2
)*(-c*e*x+e)^(1/2)-1/8*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/
2)/c^2+1/4*x^3*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-1/64*b^
2*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/8*b
*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2
)-1/8*b*c*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+
1)^(1/2)+1/24*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c^3/(-
c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.50, antiderivative size = 351, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4823, 4783, 4795, 4737, 4723, 327, 222}

$$\frac{bx^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{8c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{8\sqrt{1-c^2x^2}}-\frac{x\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{8c^2}+\frac{\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^3}{24bc^3\sqrt{1-c^2x^2}}+\frac{1}{4}x^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2-\frac{b^2\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{64c^3\sqrt{1-c^2x^2}}+\frac{b^2x\sqrt{cdx+d}\,\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{cdx+d}\,\sqrt{e-cex}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(64*c^2) - (b^2*x^3*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/32 - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(6
4*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*Ar
cSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^2)/4 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcS
in[c*x])^3)/(24*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int x^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int x^2\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right.}{\sqrt{1-c^2x^2}}$$

$$=\frac{1}{4}x^3\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2+\frac{\left(\sqrt{d+cd\right.}{}$$

$$=-\frac{bcx^4\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{8\sqrt{1-c^2x^2}}-\frac{x\sqrt{d+c}{}$$

$$=-\frac{1}{32}b^2x^3\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{bx^2\sqrt{d+cdx}\,\sqrt{e-ce}}{8c\sqrt{1-c}}$$

$$=\frac{b^2x\sqrt{d+cdx}\,\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d+cdx}\,\sqrt{e-cex}$$

$$=\frac{b^2x\sqrt{d+cdx}\,\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d+cdx}\,\sqrt{e-cex}$$

Mathematica [A]
time = 0.64, size = 297, normalized size = 0.85

$$\frac{32b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^3-96a^2\sqrt{d}\,\sqrt{e}\,\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)-12b\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)(b\cos(4\text{ArcSin}(cx))+4a\sin(4\text{ArcSin}(cx)))-24b\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^2(-4a+b\sin(4\text{ArcSin}(cx)))+3\sqrt{d+cdx}\,\sqrt{e-cex}\left(32a^2cx\sqrt{1-c^2x^2}\,(-1+2c^2x^2)-4ab\cos(4\text{ArcSin}(cx))+b^2\sin(4\text{ArcSin}(cx))\right)}{768c^3\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*Sqrt[d]*Sqrt
[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]
*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
]*(b*Cos[4*ArcSin[c*x]] + 4*a*Sin[4*ArcSin[c*x]]) - 24*b*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*ArcSin[c*x]^2*(-4*a + b*Sin[4*ArcSin[c*x]]) + 3*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(32*a^2*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^2) - 4*a*b*C
os[4*ArcSin[c*x]] + b^2*Sin[4*ArcSin[c*x]]))/(768*c^3*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.72, size = 0, normalized size = 0.00

$$\int x^2\sqrt{cdx+d}\,\sqrt{-cex+e}\,\left(a+b\arcsin\left(cx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="maxima")
```

```
[Out] -1/8*a^2*(2*(-c^2*d*x^2*e + d*e)^(3/2)*x*e^(-1)/(c^2*d) - sqrt(-c^2*d*x^2*e
 + d*e)*x/c^2 - sqrt(d)*arcsin(c*x)*e^(1/2)/c^3) + sqrt(d)*e^(1/2)*integrat
e((b^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^2*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*d
*x + d)*sqrt(-(c*x - 1)*e), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x^2\sqrt{d\,(cx+1)}\,\sqrt{-e\,(cx-1)}\,(a+b\operatorname{asin}(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.577 $\int x\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=225

$$\frac{4b^2\sqrt{d+cdx}\,\sqrt{e-cex}}{9c^2}+\frac{2b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)}{27c^2}+\frac{2bx\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{3c\sqrt{1-c^2x^2}}-$$

```
[Out] 4/9*b^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/27*b^2*(-c^2*x^2+1)*(c*d*x+d
)^(1/2)*(-c*e*x+e)^(1/2)/c^2-1/3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)
^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/3*b*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e
*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/9*b*c*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1
/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.27, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {4823, 4767, 4739, 455, 45}

$$\frac{2bx\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{3c\sqrt{1-c^2x^2}}-\frac{(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{3c^2}-\frac{2bcx^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}+\frac{2b^2(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}}{27c^2}+\frac{4b^2\sqrt{cdx+d}\,\sqrt{e-cex}}{9c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c^2) + (2*b^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(1 - c^2*x^2))/(27*c^2) + (2*b*x*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
```

```
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int x\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int x\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{3c^2} + \frac{(2}{}$$

$$= \frac{2bx\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+c}}{}$$

$$= \frac{2bx\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+c}}{}$$

$$= \frac{2bx\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+c}}{}$$

$$= \frac{4b^2\sqrt{d+cdx}\,\sqrt{e-cex}}{9c^2} + \frac{2b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-}{27c^2}$$

Mathematica [A]

time = 0.24, size = 178, normalized size = 0.79

$$\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(6abcx\sqrt{1-c^2x^2}\,(-3+c^2x^2)+9a^2(-1+c^2x^2)^2-2b^2(7-8c^2x^2+c^4x^4)+6b\left(bcx\sqrt{1-c^2x^2}\,(-3+c^2x^2)+3a(-1+c^2x^2)^2\right)\mathrm{ArcSin}(cx)+9b^2(-1+c^2x^2)^2\,\mathrm{ArcSin}(cx)^2\right)}{27c^2\,(-1+c^2x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(6*a*b*c*x*Sqrt[1 - c^2*x^2]*(-3 + c^2*x^2
) + 9*a^2*(-1 + c^2*x^2)^2 - 2*b^2*(7 - 8*c^2*x^2 + c^4*x^4) + 6*b*(b*c*x*S
qrt[1 - c^2*x^2]*(-3 + c^2*x^2) + 3*a*(-1 + c^2*x^2)^2)*ArcSin[c*x] + 9*b^2
*(-1 + c^2*x^2)^2*ArcSin[c*x]^2))/(27*c^2*(-1 + c^2*x^2))
```

Maple [F]
time = 0.26, size = 0, normalized size = 0.00

$$\int x\sqrt{cdx+d}\,\sqrt{-cex+e}\,\left(a+b\arcsin\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.49, size = 227, normalized size = 1.01

$$-\frac{\left(-c^2dx^2e+de\right)^{\frac{3}{2}}b^2\arcsin\left(cx\right)^2e^{(-1)}}{3\,c^2d}-\frac{2}{27}\,b^2\left(\frac{\left(\sqrt{-c^2x^2+1}\,d^{\frac{3}{2}}x^2e^{\frac{3}{2}}-\frac{7\,\sqrt{-c^2x^2+1}\,d^{\frac{3}{2}}e^{\frac{3}{2}}}{c^2}\right)e^{(-1)}}{d}+\frac{3\,\left(c^2d^{\frac{3}{2}}x^3e^{\frac{3}{2}}-3\,d^{\frac{3}{2}}xe^{\frac{3}{2}}\right)\arcsin\left(cx\right)e^{(-1)}}{cd}\right)-\frac{2\left(-c^2dx^2e+de\right)^{\frac{3}{2}}ab\arcsin\left(cx\right)e^{(-1)}}{3\,c^2d}-\frac{2\,\left(c^2d^{\frac{3}{2}}x^3e^{\frac{3}{2}}-3\,d^{\frac{3}{2}}xe^{\frac{3}{2}}\right)abe^{(-1)}}{9\,cd}-\frac{\left(-c^2dx^2e+de\right)^{\frac{3}{2}}a^2e^{(-1)}}{3\,c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="maxima")
```

```
[Out] -1/3*(-c^2*d*x^2*e + d*e)^(3/2)*b^2*arcsin(c*x)^2*e^(-1)/(c^2*d) - 2/27*b^2
*((sqrt(-c^2*x^2 + 1)*d^(3/2)*x^2*e^(3/2) - 7*sqrt(-c^2*x^2 + 1)*d^(3/2)*e^
(3/2)/c^2)*e^(-1)/d + 3*(c^2*d^(3/2)*x^3*e^(3/2) - 3*d^(3/2)*x*e^(3/2))*arc
sin(c*x)*e^(-1)/(c*d)) - 2/3*(-c^2*d*x^2*e + d*e)^(3/2)*a*b*arcsin(c*x)*e^(
-1)/(c^2*d) - 2/9*(c^2*d^(3/2)*x^3*e^(3/2) - 3*d^(3/2)*x*e^(3/2))*a*b*e^(-1
)/(c*d) - 1/3*(-c^2*d*x^2*e + d*e)^(3/2)*a^2*e^(-1)/(c^2*d)
```

Fricas [A]
time = 0.97, size = 212, normalized size = 0.94

$$\frac{\sqrt{cdx+d}\,\left(6\,(abc^3x^3-3\,abcx+(b^2c^3x^3-3\,b^2cx)\arcsin\left(cx\right))\sqrt{-c^2x^2+1}\,\sqrt{-(cx-1)e}+((9\,a^2-2\,b^2)c^4x^4-2\,(9\,a^2-8\,b^2)c^2x^2+9\,(b^2c^4x^4-2\,b^2c^2x^2+b^2)\arcsin\left(cx\right)^2+9\,a^2-14\,b^2+18\,(abc^4x^4-2\,abc^2x^2+ab)\arcsin\left(cx\right))\sqrt{-(cx-1)e}\right)}{27\,(c^4x^2-c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="fricas")
```

```
[Out] 1/27*sqrt(c*d*x + d)*(6*(a*b*c^3*x^3 - 3*a*b*c*x + (b^2*c^3*x^3 - 3*b^2*c*x
)*arcsin(c*x))*sqrt(-c^2*x^2 + 1)*sqrt(-(c*x - 1)*e) + ((9*a^2 - 2*b^2)*c^4
*x^4 - 2*(9*a^2 - 8*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*ar
csin(c*x)^2 + 9*a^2 - 14*b^2 + 18*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 + a*b)*arcsi
n(c*x))*sqrt(-(c*x - 1)*e))/(c^4*x^2 - c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{d\,(cx+1)}\,\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2*x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.578 $\int \sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=222

$$-\frac{1}{4}b^2x\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)}{4c\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\mathrm{ArcSin}(cx}{2\sqrt{1-c^2x^2}}$$

```
[Out] -1/4*b^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/2*x*(c*d*x+d)^(1/2)*(-c*e*x+e
)^(1/2)*(a+b*arcsin(c*x))^2+1/4*b^2*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-
c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.20, antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {4763, 4741, 4737, 4723, 327, 222}

$$\frac{\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\mathrm{ArcSin}(cx))^3}{6bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\mathrm{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\mathrm{ArcSin}(cx))^2+\frac{b^2\mathrm{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}}-\frac{1}{4}b^2x\sqrt{cdx+d}\,\sqrt{e-cex}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
```

```
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}x\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(\sqrt{d+cdx}\,\sqrt{}\right.}{}$$

$$= -\frac{bcx^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cd}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{bcx^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(a}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\,\sqrt{e-cex} + \frac{b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\sin^{-}}{4c\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 0.59, size = 288, normalized size = 1.30

$$\frac{4b^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^3-12a^2\sqrt{d}\,\sqrt{e}\,\sqrt{1-c^2x^2}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)+6b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)(b\cos(2\mathrm{ArcSin}(cx))+2a\sin(2\mathrm{ArcSin}(cx)))+6b\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)^2(2a+b\sin(2\mathrm{ArcSin}(cx)))+3\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(4a^2cx\sqrt{1-c^2x^2}+2ab\cos(2\mathrm{ArcSin}(cx))-b^2\sin(2\mathrm{ArcSin}(cx))\right)}{24c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*Sqrt[
e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*
Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*
(b*Cos[2*ArcSin[c*x]] + 2*a*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*ArcSin[c*x]^2*(2*a + b*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(4*a^2*c*x*Sqrt[1 - c^2*x^2] + 2*a*b*Cos[2*ArcSin[c*x]] - b^
2*Sin[2*ArcSin[c*x]]))/(24*c*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}\,\left(a+b\arcsin\left(cx\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/2*(sqrt(-c^2*d*x^2*e + d*e)*x + sqrt(d)*arcsin(c*x)*e^(1/2)/c)*a^2 + sqrt
(d)*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2
*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d\,(cx+1)}\,\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.579 $\int \frac{\sqrt{d+cdx}\sqrt{e-cex}\,(a+b\mathbf{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=432

$$-2b^2\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{2abcx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{ArcSin}(cx)}{\sqrt{1-c^2x^2}}+\sqrt{d+cdx}$$

```
[Out] -2*b^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a
+b*arcsin(c*x))^2-2*a*b*c*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(
1/2)-2*b^2*c*x*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1
/2)-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)
*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c
*x-(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-
2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)
*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1
/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*polylog(3,I*
c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.48, antiderivative size = 432, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.257$, Rules used = {4823, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267}

$$\frac{2ib\sqrt{cdx+d}\,\sqrt{e-cex}\,\mathrm{Li}_2\left(-e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2ib\sqrt{cdx+d}\,\sqrt{e-cex}\,\mathrm{Li}_2\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2\sqrt{cdx+d}\,\sqrt{e-cex}\,\tanh^{-1}\left(e^{i\mathrm{ArcSin}(cx)}\right)(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\mathrm{ArcSin}(cx))^2-\frac{2abcx\sqrt{cdx+d}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-\frac{2b^2\sqrt{cdx+d}\,\sqrt{e-cex}\,\mathrm{Li}_3\left(-e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{2b^2\sqrt{cdx+d}\,\sqrt{e-cex}\,\mathrm{Li}_3\left(e^{i\mathrm{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2cx\mathrm{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-2b^2\sqrt{cdx+d}\,\sqrt{e-cex}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x] - (2*a*b*c*x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSi
n[c*x])^2 - (2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2
, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \frac{\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)^2 + \frac{\left(\sqrt{d+cdx}\,\sqrt{e-\right.}{\sqrt{}}$$

$$= -\frac{2abcx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}} + \sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\,\mathrm{s}\right.$$

$$= -\frac{2abcx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\,\sqrt{e-cex}\,\mathrm{s}}{\sqrt{1-c^2x^2}}$$

$$= -2b^2\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2}{}$$

$$= -2b^2\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2}{}$$

$$= -2b^2\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2}{}$$

Mathematica [A]
time = 1.27, size = 434, normalized size = 1.00

$$a^2\sqrt{d+cdx}\,\sqrt{e-cex} + a^2\sqrt{d}\,\sqrt{e}\,\log(cx) - a^2\sqrt{d}\,\sqrt{e}\,\log\left(de+\sqrt{d}\,\sqrt{e}\,\sqrt{d+cdx}\,\sqrt{e-cex}\right) - \frac{2ab\sqrt{d+cdx}\,\sqrt{e-cex}\left(cx-\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)-\mathrm{ArcSin}(cx)\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)+\mathrm{ArcSin}(cx)\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)-i\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)+i\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}} - \frac{b^2\sqrt{d+cdx}\,\sqrt{e-cex}\left(2\sqrt{1-c^2x^2}+2cx\mathrm{ArcSin}(cx)-\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)^2-\mathrm{ArcSin}(cx)^2\log\left(1-e^{i\mathrm{ArcSin}(cx)}\right)+\mathrm{ArcSin}(cx)^2\log\left(1+e^{i\mathrm{ArcSin}(cx)}\right)-2i\mathrm{ArcSin}(cx)\mathrm{PolyLog}\left(2,-e^{i\mathrm{ArcSin}(cx)}\right)+2i\mathrm{ArcSin}(cx)\mathrm{PolyLog}\left(2,e^{i\mathrm{ArcSin}(cx)}\right)+2\mathrm{PolyLog}\left(3,-e^{i\mathrm{ArcSin}(cx)}\right)-2\mathrm{PolyLog}\left(3,e^{i\mathrm{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x] + a^2*Sqrt[d]*Sqrt[e]*Log[c*x] - a^2*Sq
rt[d]*Sqrt[e]*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]] -
(2*a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x]
 - ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*ArcSin
[c*x])] - I*PolyLog[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*x])
]))/Sqrt[1 - c^2*x^2] - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*Sqrt[1 - c^
2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - ArcSin[c*x]^
2*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] - (
2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]*PolyLog
[2, E^(I*ArcSin[c*x])] + 2*PolyLog[3, -E^(I*ArcSin[c*x])] - 2*PolyLog[3, E^
(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [**F**]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="maxima")
```

```
[Out] -(sqrt(d)*e^(1/2)*log(2*d*e/abs(x) + 2*sqrt(-c^2*d*x^2*e + d*e)*sqrt(d)*e^(
1/2)/abs(x)) - sqrt(-c^2*d*x^2*e + d*e))*a^2 + sqrt(d)*e^(1/2)*integrate((b
^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x, x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)/x, x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x, x)
```

3.580 $\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\mathbf{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=257

$$-\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\text{ArcSin}(cx))^2}{x}-\frac{ic\sqrt{d+cdx}\sqrt{e-cex}(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}-\frac{c\sqrt{d+cdx}\sqrt{e-}}{3b\sqrt{}}$$

```
[Out] -(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x-I*c*(a+b*arcsin(c*x
))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/3*c*(a+b*arcsin(
c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c*(a+b*ar
csin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1
/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(c*d
*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.42, antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {4823, 4781, 4721, 3798, 2221, 2317, 2438, 4737}

$$-\frac{c\sqrt{cdx+d}\sqrt{e-cex}(a+b\text{ArcSin}(cx))^3}{3b\sqrt{1-c^2x^2}}-\frac{ic\sqrt{cdx+d}\sqrt{e-cex}(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+\frac{2bc\sqrt{cdx+d}\sqrt{e-cex}\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{\sqrt{cdx+d}\sqrt{e-cex}(a+b\text{ArcSin}(cx))^2}{x}-\frac{ib^2c\sqrt{cdx+d}\sqrt{e-cex}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2])
+ (2*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*Log[1 - E^((2*
I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{x^2}\,dx = \frac{\left(\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2}{x^2}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{x} + \frac{\left(2bc\sqrt{d+cdx}\right.}{}$$

$$= -\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{c\sqrt{d+cdx}\,\sqrt{e}}{3}$$

$$= -\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\,\sqrt{}}{}$$

$$= -\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\,\sqrt{}}{}$$

$$= -\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\,\sqrt{}}{}$$

$$= -\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\,\sqrt{}}{}$$

Mathematica [A]
time = 0.70, size = 374, normalized size = 1.46

$$\frac{-3a^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}-3ib\sqrt{d+cdx}\sqrt{e-cex}\left(-iacx+bcx-ib\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)^2-b^2cx\sqrt{d+cdx}\sqrt{e-cex}\,\text{ArcSin}(cx)^3+3a^2c\sqrt{d}\sqrt{e}\,x\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)+6b\sqrt{d+cdx}\sqrt{e-cex}\,\text{ArcSin}(cx)\left(-a\sqrt{1-c^2x^2}+bcx\log\left(1-e^{2i\text{ArcSin}(cx)}\right)\right)+6abcx\sqrt{d+cdx}\sqrt{e-cex}\log(cx)-3ib^2cx\sqrt{d+cdx}\sqrt{e-cex}\,\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)}{3x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (-3*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - (3*I)*b*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*((-I)*a*c*x + b*c*x - I*b*Sqrt[1 - c^2*x^2])*ArcSi
n[c*x]^2 - b^2*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 3*a^2*c*
Sqrt[d]*Sqrt[e]*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x]*(-(a*Sqrt[1 - c^2*x^2]) + b*c*x*Log[1 - E^((2*I)*ArcSin[c*x]
)]) + 6*a*b*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Log[c*x] - (3*I)*b^2*c*x*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*x*Sqrt[
1 - c^2*x^2])
```

Maple [F]
time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{cdx+d}\,\,\sqrt{-cex+e}\,\,(a+b\arcsin(cx))^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="maxima")
```

```
[Out] -(c*sqrt(d)*arcsin(c*x)*e^(1/2) + sqrt(-c^2*d*x^2*e + d*e)/x)*a^2 + sqrt(d)
*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*
b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/
x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)/x^2, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\,(cx+1)}\,\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/x**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/x^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x^2, x)
```

3.581 $\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=509

$$-\frac{7b^2dex\sqrt{d+cdx}\,\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{d+cdx}\,\sqrt{e-cex}}{1728}+\frac{1}{108}b^2c^2dex^5\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{7b^2de\sqrt{c}}{}$$

```
[Out] -7/1152*b^2*d*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2-43/1728*b^2*d*e*x^3*
(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/108*b^2*c^2*d*e*x^5*(c*d*x+d)^(1/2)*(-c*
e*x+e)^(1/2)-1/16*d*e*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2
)/c^2+1/8*d*e*x^3*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/6*
d*e*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+7
/1152*b^2*d*e*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^3/(-c^2*x^2+1)
^(1/2)+1/16*b*d*e*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/
(-c^2*x^2+1)^(1/2)-7/48*b*c*d*e*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e
*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/18*b*c^3*d*e*x^6*(a+b*arcsin(c*x))*(c*d*x+
d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/48*d*e*(a+b*arcsin(c*x))^3*(
c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.74, antiderivative size = 509, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 12, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.343$, Rules used = {4823, 4787, 4783, 4795, 4737, 4723, 327, 222, 14, 4777, 12, 470}

$$\frac{bdex^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{16c\sqrt{1-c^2x^2}}-\frac{7bcdex^4\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{48\sqrt{1-c^2x^2}}+\frac{1}{6}dex^3(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2-\frac{dex\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{16c^2}+\frac{de\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^3}{48bc^3\sqrt{1-c^2x^2}}+\frac{bc^3dex^6\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{18\sqrt{1-c^2x^2}}+\frac{1}{8}dex^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2+\frac{7b^2de\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{1152c^3\sqrt{1-c^2x^2}}+\frac{1}{108}b^2c^2dex^5\sqrt{cdx+d}\,\sqrt{e-cex}-\frac{7b^2dex\sqrt{cdx+d}\,\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{cdx+d}\,\sqrt{e-cex}}{1728}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-7*b^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1152*c^2) - (43*b^2*d*e*x^3
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/1728 + (b^2*c^2*d*e*x^5*Sqrt[d + c*d*x]*S
qrt[e - c*e*x])/108 + (7*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*e*x^4*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*
d*e*x^6*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c
^2*x^2]) - (d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(1
6*c^2) + (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8
+ (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/6 + (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(48*b*
c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
```

```
IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{\left(de\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int x^2(1-c^2x^2)^{3/2}\left(a+b\sin\right.}{\sqrt{1-c^2x^2}}$$

$$=\frac{1}{6}dex^3\sqrt{d+cdx}\,\sqrt{e-cex}\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx\right.$$

$$=-\frac{bcdex^4\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))}{12\sqrt{1-c^2x^2}}+\frac{bc^3}{}$$

$$=-\frac{7bcdex^4\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+b\sin^{-1}(cx))}{48\sqrt{1-c^2x^2}}+\frac{bc}{}$$

$$=-\frac{1}{64}b^2dex^3\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{1}{108}b^2c^2dex^5\sqrt{d+}$$

$$=\frac{b^2dex\sqrt{d+cdx}\,\sqrt{e-cex}}{128c^2}-\frac{43b^2dex^3\sqrt{d+cdx}\,\sqrt{e}}{1728}$$

$$=-\frac{7b^2dex\sqrt{d+cdx}\,\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{d+cdx}}{1728}$$

$$=-\frac{7b^2dex\sqrt{d+cdx}\,\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{d+cdx}}{1728}$$

Mathematica [A]
time = 1.33, size = 452, normalized size = 0.89

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (288*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 864*a^2*d^(3/2
)*e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*
ArcSin[c*x]*(-18*b*Cos[2*ArcSin[c*x]] + 9*b*Cos[4*ArcSin[c*x]] + 2*b*Cos[6*
ArcSin[c*x]] - 36*a*Sin[2*ArcSin[c*x]] + 36*a*Sin[4*ArcSin[c*x]] + 12*a*Sin
[6*ArcSin[c*x]]) - 72*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(
-12*a - 3*b*Sin[2*ArcSin[c*x]] + 3*b*Sin[4*ArcSin[c*x]] + b*Sin[6*ArcSin[c*
x]]) + d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-864*a^2*c*x*Sqrt[1 - c^2*x^2]
+ 4032*a^2*c^3*x^3*Sqrt[1 - c^2*x^2] - 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] +
 216*a*b*Cos[2*ArcSin[c*x]] - 108*a*b*Cos[4*ArcSin[c*x]] - 24*a*b*Cos[6*Arc
```

```
Sin[c*x]] - 108*b^2*Sin[2*ArcSin[c*x]] + 27*b^2*Sin[4*ArcSin[c*x]] + 4*b^2*
Sin[6*ArcSin[c*x]]))/(13824*c^3*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.59, size = 0, normalized size = 0.00

$$\int x^{2}(cdx+d)^{\frac{3}{2}}\left(-cex+e\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="maxima")
```

```
[Out] 1/48*(3*sqrt(-c^2*d*x^2*e + d*e)*d*x*e/c^2 - 8*(-c^2*d*x^2*e + d*e)^(5/2)*x
*e^(-1)/(c^2*d) + 2*(-c^2*d*x^2*e + d*e)^(3/2)*x/c^2 + 3*d^(3/2)*arcsin(c*x
)*e^(3/2)/c^3)*a^2 + sqrt(d)*e^(1/2)*integrate(-((b^2*c^2*d*x^4*e - b^2*d*x
^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^4*e - a
*b*d*x^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(
-c*x + 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="fricas")
```

```
[Out] integral(-((b^2*c^2*d*x^4 - b^2*d*x^2)*arcsin(c*x)^2*e + 2*(a*b*c^2*d*x^4 -
 a*b*d*x^2)*arcsin(c*x)*e + (a^2*c^2*d*x^4 - a^2*d*x^2)*e)*sqrt(c*d*x + d)*
sqrt(-(c*x - 1)*e), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 8568 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2*x^2, x
)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.582 $\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=338

$$\frac{16b^2de\sqrt{d+cdx}\,\sqrt{e-cex}}{75c^2}+\frac{8b^2de\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)}{225c^2}+\frac{2b^2de\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)^2}{125c^2}+$$

```
[Out] 16/75*b^2*d*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+8/225*b^2*d*e*(-c^2*x^2+
1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/125*b^2*d*e*(-c^2*x^2+1)^2*(c*d*x
+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2-1/5*d*e*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(
c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/5*b*d*e*x*(a+b*arcsin(c*x))*(c*d*x+d)
^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*e*x^3*(a+b*arcsin(c
*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*e*x^5
*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.35, antiderivative size = 338, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}=0.212$, Rules used = {4823, 4767, 200, 4739, 12, 1261, 712}

$$\frac{2bdex\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{5c\sqrt{1-c^2x^2}}-\frac{de(1-c^2x^2)^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{5c^2}-\frac{4bcdex^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dex^5\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{25\sqrt{1-c^2x^2}}+\frac{2b^2de(1-c^2x^2)^2\sqrt{cdx+d}\,\sqrt{e-cex}}{125c^2}+\frac{8b^2de(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}}{225c^2}+\frac{16b^2de\sqrt{cdx+d}\,\sqrt{e-cex}}{75c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (16*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(75*c^2) + (8*b^2*d*e*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(225*c^2) + (2*b^2*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)^2)/(125*c^2) + (2*b*d*e*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x^2]) - (4*b*c*d*e*x
^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^
2]) + (2*b*c^3*d*e*x^5*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(25*Sqrt[1 - c^2*x^2]) - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x])^2)/(5*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx=\frac{\left(de\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int x(1-c^2x^2)^{3/2}\left(a+b\sin^{-1}\right.}{\sqrt{1-c^2x^2}}$$

$$=-\frac{de\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)^2\left(a+b\sin^{-1}(cx)\right)^2}{5c^2}$$

$$=\frac{2bdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdex^3}{}$$

$$=\frac{2bdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdex^3}{}$$

$$=\frac{2bdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdex^3}{}$$

$$=\frac{2bdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(a+b\sin^{-1}(cx)\right)}{5c\sqrt{1-c^2x^2}}-\frac{4bcdex^3}{}$$

$$=\frac{16b^2de\sqrt{d+cdx}\,\sqrt{e-cex}}{75c^2}+\frac{8b^2de\sqrt{d+cdx}\,\sqrt{e-ce}}{225c^2}$$

Mathematica [A]
time = 0.38, size = 207, normalized size = 0.61

$$-\frac{de\sqrt{d+cdx}\,\sqrt{e-cex}\left(225a^2(-1+c^2x^2)^3+30abcx\sqrt{1-c^2x^2}\,(15-10c^2x^2+3c^4x^4)+2b^2(149-187c^2x^2+47c^4x^4-9c^6x^6)+30b\left(15a(-1+c^2x^2)^3+bcx\sqrt{1-c^2x^2}\,(15-10c^2x^2+3c^4x^4)\right)\mathrm{ArcSin}(cx)+225b^2(-1+c^2x^2)^3\,\mathrm{ArcSin}(cx)^2\right)}{1125c^2\,(-1+c^2x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/1125*(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(225*a^2*(-1 + c^2*x^2)^3 + 30
*a*b*c*x*Sqrt[1 - c^2*x^2]*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 2*b^2*(149 - 187
*c^2*x^2 + 47*c^4*x^4 - 9*c^6*x^6) + 30*b*(15*a*(-1 + c^2*x^2)^3 + b*c*x*Sq
rt[1 - c^2*x^2]*(15 - 10*c^2*x^2 + 3*c^4*x^4))*ArcSin[c*x] + 225*b^2*(-1 +
c^2*x^2)^3*ArcSin[c*x]^2))/(c^2*(-1 + c^2*x^2))
```

Maple [F]
time = 0.28, size = 0, normalized size = 0.00

$$\int x(cdx+d)^{\frac{3}{2}}\left(-cex+e\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.54, size = 281, normalized size = 0.83

$$-\frac{(-c^2dx^2e+de)^{\frac{5}{2}}b^2\arcsin(cx)^2e^{(-1)}}{5c^2d}-\frac{2(-c^2dx^2e+de)^{\frac{5}{2}}ab\arcsin(cx)e^{(-1)}}{5c^2d}+\frac{2}{1125}b^2\left(\frac{\left(9\sqrt{-c^2x^2+1}\,c^2d^{\frac{5}{2}}x^4e^{\frac{5}{2}}-38\sqrt{-c^2x^2+1}\,d^{\frac{5}{2}}x^2e^{\frac{5}{2}}+\frac{149\sqrt{-c^2x^2+1}\,d^{\frac{5}{2}}e^{\frac{5}{2}}}{c^2}\right)e^{(-1)}}{d}+\frac{15\left(3c^4d^{\frac{5}{2}}x^5e^{\frac{5}{2}}-10c^2d^{\frac{5}{2}}x^3e^{\frac{5}{2}}+15d^{\frac{5}{2}}xe^{\frac{5}{2}}\right)\arcsin(cx)e^{(-1)}}{cd}\right)-\frac{(-c^2dx^2e+de)^{\frac{5}{2}}a^2e^{(-1)}}{5c^2d}+\frac{2\left(3c^4d^{\frac{5}{2}}x^5e^{\frac{5}{2}}-10c^2d^{\frac{5}{2}}x^3e^{\frac{5}{2}}+15d^{\frac{5}{2}}xe^{\frac{5}{2}}\right)abe^{(-1)}}{75cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="maxima")
```

```
[Out] -1/5*(-c^2*d*x^2*e + d*e)^(5/2)*b^2*arcsin(c*x)^2*e^(-1)/(c^2*d) - 2/5*(-c^
2*d*x^2*e + d*e)^(5/2)*a*b*arcsin(c*x)*e^(-1)/(c^2*d) + 2/1125*b^2*((9*sqrt
(-c^2*x^2 + 1)*c^2*d^(5/2)*x^4*e^(5/2) - 38*sqrt(-c^2*x^2 + 1)*d^(5/2)*x^2*
e^(5/2) + 149*sqrt(-c^2*x^2 + 1)*d^(5/2)*e^(5/2)/c^2)*e^(-1)/d + 15*(3*c^4*
d^(5/2)*x^5*e^(5/2) - 10*c^2*d^(5/2)*x^3*e^(5/2) + 15*d^(5/2)*x*e^(5/2))*ar
csin(c*x)*e^(-1)/(c*d)) - 1/5*(-c^2*d*x^2*e + d*e)^(5/2)*a^2*e^(-1)/(c^2*d)
 + 2/75*(3*c^4*d^(5/2)*x^5*e^(5/2) - 10*c^2*d^(5/2)*x^3*e^(5/2) + 15*d^(5/2
)*x*e^(5/2))*a*b*e^(-1)/(c*d)
```

Fricas [A]
time = 1.99, size = 313, normalized size = 0.93

$$-\frac{\sqrt{cdx+d}\left(30\sqrt{-c^2x^2+1}\left((3b^2c^5dx^5-10b^2c^3dx^3+15b^2cdx)\arcsin(cx)e+(3abc^5dx^5-10abc^3dx^3+15abcdx)e\right)\sqrt{-(cx-1)e}+\left(225(b^2c^6dx^6-3b^2c^4dx^4+3b^2c^2dx^2-b^2d)\arcsin(cx)^2e+450(abc^6dx^6-3abc^4dx^4+3abc^2dx^2-abd)\arcsin(cx)e+(9(25a^2-2b^2)c^6dx^6-(675a^2-94b^2)c^4dx^4+(675a^2-374b^2)c^2dx^2-(225a^2-298b^2)d)e\right)\sqrt{-(cx-1)e}\right)}{1125(c^4x^2-c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="fricas")
```

```
[Out] -1/1125*sqrt(c*d*x + d)*(30*sqrt(-c^2*x^2 + 1)*((3*b^2*c^5*d*x^5 - 10*b^2*c
^3*d*x^3 + 15*b^2*c*d*x)*arcsin(c*x)*e + (3*a*b*c^5*d*x^5 - 10*a*b*c^3*d*x^
3 + 15*a*b*c*d*x)*e)*sqrt(-(c*x - 1)*e) + (225*(b^2*c^6*d*x^6 - 3*b^2*c^4*d
*x^4 + 3*b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2*e + 450*(a*b*c^6*d*x^6 - 3*a*
b*c^4*d*x^4 + 3*a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x)*e + (9*(25*a^2 - 2*b^2)*
c^6*d*x^6 - (675*a^2 - 94*b^2)*c^4*d*x^4 + (675*a^2 - 374*b^2)*c^2*d*x^2 -
(225*a^2 - 298*b^2)*d)*e)*sqrt(-(c*x - 1)*e))/(c^4*x^2 - c^2)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6188 deep
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2*x, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(d+c\,d\,x\right)}^{3/2}\,{\left(e-c\,e\,x\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.583 $\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=362

$$-\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\,(1-c^2x^2)}+\frac{9b^2(d+cdx)^{3/2}(e-cex)^{3/2}\mathrm{ArcSin}(cx)}{64c\,(1-c^2x^2)^{3/2}}-\frac{3b$$

```
[Out] -1/32*b^2*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)-15/64*b^2*x*(c*d*x+d)^(3/2)*(-
c*e*x+e)^(3/2)/(-c^2*x^2+1)+9/64*b^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*arcsi
n(c*x)/c/(-c^2*x^2+1)^(3/2)-3/8*b*c*x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a
+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)+1/4*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(
a+b*arcsin(c*x))^2+3/8*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))
^2/(-c^2*x^2+1)+1/8*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/
c/(-c^2*x^2+1)^(3/2)+1/8*b*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x
))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.31, antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.281$, Rules used = {4763, 4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\mathrm{ArcSin}(cx))^3}{8bc\,(1-c^2x^2)^{3/2}}+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\mathrm{ArcSin}(cx))^2}{8\,(1-c^2x^2)}+\frac{b\sqrt{1-c^2x^2}\,(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\mathrm{ArcSin}(cx))}{8c}-\frac{3bcx^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\mathrm{ArcSin}(cx))}{8\,(1-c^2x^2)^{3/2}}+\frac{1}{4}x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\mathrm{ArcSin}(cx))^2+\frac{9b^2\mathrm{ArcSin}(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c\,(1-c^2x^2)^{3/2}}-\frac{15b^2x(cdx+d)^{3/2}(e-cex)^{3/2}}{64\,(1-c^2x^2)}-\frac{1}{32}b^2x(cdx+d)^{3/2}(e-cex)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/32*(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (15*b^2*x*(d + c*d*x)^(
3/2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (
b*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 +
 (3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^
2*x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*
c*(1 - c^2*x^2)^(3/2))
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2\,dx = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(c\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2 + \frac{(3(d+}{}$$

$$= \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{8c} +$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{3bcx^2(d+cdx)^{3/2}(e}{8(1}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e}{64\left(1-c^2x^2\right.}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e}{64\left(1-c^2x^2\right.}$$

Mathematica [A]
time = 0.47, size = 373, normalized size = 1.03

$$\frac{32b^2de\sqrt{d+cdx}\sqrt{e-cex}\,\text{ArcSin}(cx)^3-96a^2d^{3/2}e^{3/2}\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\,(-1+c^2x^2)}\right)+8bde\sqrt{d+cdx}\sqrt{e-cex}\,\text{ArcSin}(cx)^2(12a+8b\sin(2\text{ArcSin}(cx))+b\sin(4\text{ArcSin}(cx)))+de\sqrt{d+cdx}\sqrt{e-cex}\left(160a^2cx\sqrt{1-c^2x^2}-64a^2c^3x^3\sqrt{1-c^2x^2}+64ab\cos(2\text{ArcSin}(cx))+4ab\cos(4\text{ArcSin}(cx))-32b^2\sin(2\text{ArcSin}(cx))-b^2\sin(4\text{ArcSin}(cx))\right)+4bde\sqrt{d+cdx}\sqrt{e-cex}\,\text{ArcSin}(cx)(16b\cos(2\text{ArcSin}(cx))+b\cos(4\text{ArcSin}(cx))+4a(8\sin(2\text{ArcSin}(cx))+\sin(4\text{ArcSin}(cx))))}{256c\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*
e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqr
```

```
t[d]*Sqrt[e]*(-1 + c^2*x^2))] + 8*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Arc
Sin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]]) + d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c^3*x^
3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c*x]]
- 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[
c*x]] + 4*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c
^2*x^2])
```

Maple [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int (cdx+d)^{\frac{3}{2}} (-cex+e)^{\frac{3}{2}} (a+b\arcsin(cx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] 1/8*(3*sqrt(-c^2*d*x^2*e + d*e)*d*x*e + 2*(-c^2*d*x^2*e + d*e)^(3/2)*x + 3*
d^(3/2)*arcsin(c*x)*e^(3/2)/c)*a^2 + sqrt(d)*e^(1/2)*integrate(-((b^2*c^2*d
*x^2*e - b^2*d*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2
*d*x^2*e - a*b*d*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x +
1)*sqrt(-c*x + 1), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-((b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2*e + 2*(a*b*c^2*d*x^2 - a*b
*d)*arcsin(c*x)*e + (a^2*c^2*d*x^2 - a^2*d)*e)*sqrt(c*d*x + d)*sqrt(-(c*x -
 1)*e), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4368 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.584 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{x}\,dx$

Optimal. Leaf size=647

$$-\frac{22}{9}b^2de\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{2abcdex\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-\frac{2}{27}b^2de\sqrt{d+cdx}\,\sqrt{e-cex}\,(1-c^2x^2)-\frac{2b^2c}{}$$

```
[Out] -22/9*b^2*d*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-2/27*b^2*d*e*(-c^2*x^2+1)*(c
*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+d*e*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*
e*x+e)^(1/2)+1/3*d*e*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e
*x+e)^(1/2)-2*a*b*c*d*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/
2)-2*b^2*c*d*e*x*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^
(1/2)-2/3*b*c*d*e*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^
2*x^2+1)^(1/2)+2/9*b*c^3*d*e*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+
e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*d*e*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x
^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2*I*b*d*e*
(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*
e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*I*b*d*e*(a+b*arcsin(c*x))*polylog(2,I*c*x
+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*
b^2*d*e*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/
2)/(-c^2*x^2+1)^(1/2)+2*b^2*d*e*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+
d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A]
time = 0.70, antiderivative size = 647, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.371$, Rules used = {4823, 4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45}

$$\frac{2ibde\sqrt{cdx+d}\,\sqrt{e-cex}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2ibde\sqrt{cdx+d}\,\sqrt{e-cex}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{2bcdex\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{3\sqrt{1-c^2x^2}}+\frac{1}{3}de(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2-\frac{2de\sqrt{cdx+d}\,\sqrt{e-cex}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+\frac{2bc^3dex^3\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{9\sqrt{1-c^2x^2}}+de\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2-\frac{2abcdex\sqrt{cdx+d}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-\frac{2b^2de\sqrt{cdx+d}\,\sqrt{e-cex}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{2b^2de\sqrt{cdx+d}\,\sqrt{e-cex}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2cdex\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-\frac{2}{27}b^2de(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}-\frac{22}{9}b^2de\sqrt{cdx+d}\,\sqrt{e-cex}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (-22*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/9 - (2*a*b*c*d*e*x*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(1 - c^2*x^2))/27 - (2*b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*e*x^3*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2 + (d*e*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/3 - (2*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[1 - c^2*x^2] + ((2*I)*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin
[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*e*Sqr
```

```
t[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog
[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*d*e*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
```

```
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
```

```
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx = \frac{\left(de\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \frac{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{3}de\sqrt{d+cdx}\,\sqrt{e-cex}\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2 -$$

$$= -\frac{2bcdex\sqrt{d+cdx}\,\sqrt{e-cex}\left(a+b\sin^{-1}(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{2bc^3d}{}$$

$$= -\frac{2abcdex\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2bcdex\sqrt{d+cdx}\,\sqrt{e}}{3\sqrt{1}}$$

$$= -\frac{2abcdex\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cdex\sqrt{d+cdx}\,\sqrt{}}{\sqrt{1-c}}$$

$$= -\frac{22}{9}b^2de\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\,\sqrt{e}}{\sqrt{1-c^2x^2}}$$

$$= -\frac{22}{9}b^2de\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\,\sqrt{e}}{\sqrt{1-c^2x^2}}$$

$$= -\frac{22}{9}b^2de\sqrt{d+cdx}\,\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\,\sqrt{e}}{\sqrt{1-c^2x^2}}$$

Mathematica [A]
time = 2.92, size = 632, normalized size = 0.98

$$-\frac{1}{3}a^2de\sqrt{d+cdx}\,\sqrt{e-cex}\left(-4+c^2x^2\right)+\frac{2abde\sqrt{d+cdx}\,\sqrt{e-cex}\left(-3cx+c^3x^3+3\left(1-c^2x^2\right)^{3/2}\text{ArcSin}(cx)\right)}{9\sqrt{1-c^2x^2}}+a^2d^{3/2}e^{3/2}\log(cx)-a^2d^{3/2}e^{3/2}\log\left(de+\sqrt{d}\,\sqrt{e}\,\sqrt{d+cdx}\,\sqrt{e-cex}\right)-\frac{2abde\sqrt{d+cdx}\,\sqrt{e-cex}\left(cx-\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)-\text{ArcSin}(cx)\log\left(1-e^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)\log\left(1+e^{i\text{ArcSin}(cx)}\right)-i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)+i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}-\frac{b^2de\sqrt{d+cdx}\,\sqrt{e-cex}\left(2\sqrt{1-c^2x^2}+2cx\text{ArcSin}(cx)-\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2-\text{ArcSin}(cx)^2\log\left(1-e^{i\text{ArcSin}(cx)}\right)+\text{ArcSin}(cx)^2\log\left(1+e^{i\text{ArcSin}(cx)}\right)-2i\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)+2i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)+2\text{PolyLog}\left(3,-e^{i\text{ArcSin}(cx)}\right)-2\text{PolyLog}\left(3,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{1-c^2x^2}}+\frac{b^2de\sqrt{d+cdx}\,\sqrt{e-cex}\left(27\sqrt{1-c^2x^2}\left(-2+\text{ArcSin}(cx)^2\right)+\left(-2+9\text{ArcSin}(cx)^2\right)\cos(3\text{ArcSin}(cx))-6\text{ArcSin}(cx)(9cx+\sin(3\text{ArcSin}(cx)))\right)}{108\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -1/3*(a^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4 + c^2*x^2)) + (2*a*b*d*e*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-3*c*x + c^3*x^3 + 3*(1 - c^2*x^2)^(3/2)*A
rcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + a^2*d^(3/2)*e^(3/2)*Log[c*x] - a^2*d^(
3/2)*e^(3/2)*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]] - (
2*a*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c
*x] - ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*Arc
Sin[c*x])] - I*PolyLog[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*
x])]))/Sqrt[1 - c^2*x^2] - (b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*Sqrt
[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - ArcSi
n[c*x]^2*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x
])] - (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]*
PolyLog[2, E^(I*ArcSin[c*x])] + 2*PolyLog[3, -E^(I*ArcSin[c*x])] - 2*PolyLo
g[3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (b^2*d*e*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(27*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x
]^2)*Cos[3*ArcSin[c*x]] - 6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108
*Sqrt[1 - c^2*x^2])
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{3}{2}}\left(-cex+e\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^{2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="maxima")
```

```
[Out] -1/3*(3*d^(3/2)*e^(3/2)*log(2*d*e/abs(x) + 2*sqrt(-c^2*d*x^2*e + d*e)*sqrt(
d)*e^(1/2)/abs(x)) - 3*sqrt(-c^2*d*x^2*e + d*e)*d*e - (-c^2*d*x^2*e + d*e)^
(3/2))*a^2 - sqrt(d)*e^(1/2)*integrate(((b^2*c^2*d*x^2*e - b^2*d*e)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2*e - a*b*d*e)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="fricas")
```

```
[Out] integral(-((b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2*e + 2*(a*b*c^2*d*x^2 - a*b
*d)*arcsin(c*x)*e + (a^2*c^2*d*x^2 - a^2*d)*e)*sqrt(c*d*x + d)*sqrt(-(c*x -
 1)*e)/x, x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x, x)
```

3.585 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\text{ArcSin}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=505

$$\frac{1}{4}b^2c^2dex\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{5b^2cde\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)}{4\sqrt{1-c^2x^2}}+\frac{3bc^3dex^2\sqrt{d+cdx}\,\sqrt{e-cex}\,(a+}{2\sqrt{1-c^2x^2}}$$

```
[Out] 1/4*b^2*c^2*d*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-3/2*c^2*d*e*x*(a+b*arcsi
n(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-d*e*(-c^2*x^2+1)*(a+b*arcsin(c*x
))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/x-5/4*b^2*c*d*e*arcsin(c*x)*(c*d*x+d)
^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+3/2*b*c^3*d*e*x^2*(a+b*arcsin(c*
x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-I*c*d*e*(a+b*arcsin
(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*c*d*e*(a+b
*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c
*d*e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*d*e*polylog(2,(I*c*x+(-c^2*x^2+1
)^(1/2))^2)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+b*c*d*e*(a+
b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^(1/2)
```

Rubi [A]

time = 0.60, antiderivative size = 505, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 14, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4823, 4785, 4741, 4737, 4723, 327, 222, 4773, 4721, 3798, 2221, 2317, 2438, 201}

$$-\frac{cde\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^3}{2b\sqrt{1-c^2x^2}}-\frac{icde\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{1-c^2x^2}}+bcde\sqrt{1-c^2x^2}\,\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))-\frac{de(1-c^2x^2)\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2}{x}+\frac{2bcde\sqrt{cdx+d}\,\sqrt{e-cex}\,\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2dex\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))^2+\frac{3bc^3dex^2\sqrt{cdx+d}\,\sqrt{e-cex}\,(a+b\text{ArcSin}(cx))}{2\sqrt{1-c^2x^2}}-\frac{ib^2cde\sqrt{cdx+d}\,\sqrt{e-cex}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{5b^2cde\text{ArcSin}(cx)\sqrt{cdx+d}\,\sqrt{e-cex}}{4\sqrt{1-c^2x^2}}+\frac{1}{4}b^2c^2dex\sqrt{cdx+d}\,\sqrt{e-cex}$$

Antiderivative was successfully verified.

```
[In] Int[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (b^2*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 - (5*b^2*c*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*e*x^2
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2])
 + b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x]) - (3*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)
/2 - (I*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1
 - c^2*x^2] - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*Arc
Sin[c*x])^2)/x - (c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/
Sqrt[1 - c^2*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx = \frac{\left(de\sqrt{d+cdx}\,\sqrt{e-cex}\right)\int \frac{\left(1-c^2x^2\right)^{3/2}\left(a+b\sin^{-1}(cx)\right)^2}{x^2}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{de\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{x}$$

$$= bcde\sqrt{d+cdx}\,\sqrt{e-cex}\,\sqrt{1-c^2x^2}\,\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{1}{2}b^2c^2dex\sqrt{d+cdx}\,\sqrt{e-cex}+\frac{3bc^3dex^2\sqrt{d+cdx}}{2\sqrt{}}$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{b^2cde\sqrt{d+cdx}\,\sqrt{e-}}{2\sqrt{1-c^2x}}$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{5b^2cde\sqrt{d+cdx}\,\sqrt{e-}}{4\sqrt{1-c^2}}$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{5b^2cde\sqrt{d+cdx}\,\sqrt{e-}}{4\sqrt{1-c^2}}$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\,\sqrt{e-cex}-\frac{5b^2cde\sqrt{d+cdx}\,\sqrt{e-}}{4\sqrt{1-c^2}}$$

Mathematica [**A**]
time = 1.39, size = 538, normalized size = 1.07

$$\frac{-8a^2de\sqrt{d+cdx}\,\sqrt{e-cex}\,\sqrt{1-c^2x^2}-4a^2c^2dex^2\sqrt{d+cdx}\,\sqrt{e-cex}\,\sqrt{1-c^2x^2}-4b^2cdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^3+12a^2cd^{3/2}e^{3/2}x\sqrt{1-c^2x^2}\,\text{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)-2abcdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\cos(2\text{ArcSin}(cx))+16abcdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\log(cx)-8ib^2cdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)+b^2cdex\sqrt{d+cdx}\,\sqrt{e-cex}\,\sin(2\text{ArcSin}(cx))-2bde\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)\left(8a\sqrt{1-c^2x^2}+bcx\cos(2\text{ArcSin}(cx))-8bcx\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+2acx\sin(2\text{ArcSin}(cx))\right)-2bde\sqrt{d+cdx}\,\sqrt{e-cex}\,\text{ArcSin}(cx)^2\left(6acx+4ibcx+4b\sqrt{1-c^2x^2}+bcx\sin(2\text{ArcSin}(cx))\right)}{8x\sqrt{1-c^2x^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x
]
```

```
[Out] (-8*a^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - 4*a^2*c^2*d
*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - 4*b^2*c*d*e*x*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 12*a^2*c*d^(3/2)*e^(3/2)*x*Sq
rt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[
e]*(-1 + c^2*x^2))] - 2*a*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Cos[2*A
rcSin[c*x]] + 16*a*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Log[c*x] - (8*
I)*b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c
*x])] + b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sin[2*ArcSin[c*x]] - 2*
b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(8*a*Sqrt[1 - c^2*x^2] +
b*c*x*Cos[2*ArcSin[c*x]] - 8*b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*a*c*x
*Sin[2*ArcSin[c*x]]) - 2*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^
2*(6*a*c*x + (4*I)*b*c*x + 4*b*Sqrt[1 - c^2*x^2] + b*c*x*Sin[2*ArcSin[c*x]]
))/(8*x*Sqrt[1 - c^2*x^2])
```

Maple [**F**]
time = 1.02, size = 0, normalized size = 0.00

$$\int \frac{(cdx+d)^{\frac{3}{2}} (-cex+e)^{\frac{3}{2}} (a+b\arcsin(cx))^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="maxima")
```

```
[Out] -1/2*(3*sqrt(-c^2*d*x^2*e + d*e)*c^2*d*x*e + 3*c*d^(3/2)*arcsin(c*x)*e^(3/2
) + 2*(-c^2*d*x^2*e + d*e)^(3/2)/x)*a^2 - sqrt(d)*e^(1/2)*integrate(((b^2*c
^2*d*x^2*e - b^2*d*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b
*c^2*d*x^2*e - a*b*d*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*
x + 1)*sqrt(-c*x + 1)/x^2, x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="fricas")
```

```
[Out] integral(-((b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2*e + 2*(a*b*c^2*d*x^2 - a*b
*d)*arcsin(c*x)*e + (a^2*c^2*d*x^2 - a^2*d)*e)*sqrt(c*d*x + d)*sqrt(-(c*x -
 1)*e)/x^2, x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/x^2, x
)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x^2, x)
```

3.586 $\int \frac{x^2(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=250

$$\frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d+cdx}\sqrt{e-cex}}-\frac{b^2\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)}{4c^3\sqrt{d+cdx}\sqrt{e-cex}}+\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{2c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{x(1-c^2x^2)\,(a+b\mathrm{A}}{2c^2\sqrt{d+cdx}\sqrt{e}}$$

```
[Out] 1/4*b^2*x*(-c^2*x^2+1)/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/2*x*(-c^2*x^2
+1)*(a+b*arcsin(c*x))^2/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/4*b^2*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*b*x^2*(a+
b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/6*(a
+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.42, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.171$, Rules used = {4823, 4795, 4737, 4723, 327, 222}

$$-\frac{x(1-c^2x^2)\,(a+b\mathrm{ArcSin}(cx))^2}{2c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{bx^2\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))}{2c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))^3}{6bc^3\sqrt{cdx+d}\sqrt{e-cex}}-\frac{b^2\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)}{4c^3\sqrt{cdx+d}\sqrt{e-cex}}+\frac{b^2x(1-c^2x^2)}{4c^2\sqrt{cdx+d}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (b^2*x*(1 - c^2*x^2))/(4*c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*Sqrt[1
 - c^2*x^2]*ArcSin[c*x])/(4*c^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 - (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*c^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\,\int \frac{x^2(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= -\frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{2c^2\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\,\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2c^2\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\left(b\sqrt{1-c\cdots\right.}{c\cdots}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{2c^2\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\cdots}{6bc^3\sqrt{d\cdots}}$$

$$= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{2c\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{x(1-c^2x^2)\,(a\cdots}{2c^2\sqrt{d+cdx\cdots}}$$

$$= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{b^2\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{4c^3\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}\,(a+b\,\mathrm{si}\cdots}{2c\sqrt{d+cdx}\,\sqrt{e-\cdots}}$$

Mathematica [A]
time = 0.78, size = 326, normalized size = 1.30

$$\frac{12b\sqrt{d}\sqrt{e}\left(a\sqrt{1-c^2x^2}+bcx(-1+c^2x^2)\right)\mathrm{ArcSin}(cx)^2+4b^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)^3-12a^2\sqrt{d+cdx}\sqrt{e-cex}\,\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}\,(-1+c^2x^2)}\right)-3\sqrt{d}\sqrt{e}\left(ab\sqrt{1-c^2x^2}+2b^2cx(-1+c^2x^2)+a^2(4cx-4c^3x^3)+ab\cos(3\mathrm{ArcSin}(cx))\right)-3b\sqrt{d}\sqrt{e}\,\mathrm{ArcSin}(cx)\left(2acx+b\sqrt{1-c^2x^2}+b\cos(3\mathrm{ArcSin}(cx))+2a\sin(3\mathrm{ArcSin}(cx))\right)}{24c^3\sqrt{d}\sqrt{e}\sqrt{d+cdx}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (12*b*Sqrt[d]*Sqrt[e]*(a*Sqrt[1 - c^2*x^2] + b*c*x*(-1 + c^2*x^2))*ArcSin[c
*x]^2 + 4*b^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3 - 12*a^2*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 3*Sqrt[d]*Sqrt[e]*(a*b*Sqrt[1 - c^2*x^2]
+ 2*b^2*c*x*(-1 + c^2*x^2) + a^2*(4*c*x - 4*c^3*x^3) + a*b*Cos[3*ArcSin[c*x
]]) - 3*b*Sqrt[d]*Sqrt[e]*ArcSin[c*x]*(2*a*c*x + b*Sqrt[1 - c^2*x^2] + b*Co
s[3*ArcSin[c*x]] + 2*a*Sin[3*ArcSin[c*x]]))/(24*c^3*Sqrt[d]*Sqrt[e]*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]
time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="maxima")
```

```
[Out] -1/2*a^2*(sqrt(-c^2*d*x^2*e + d*e)*x*e^(-1)/(c^2*d) - arcsin(c*x)*e^(-1/2)/
(c^3*sqrt(d))) - sqrt(d)*e^(1/2)*integrate((b^2*x^2*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^2*e - d*e), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*
d*x + d)*sqrt(-(c*x - 1)*e)*e^(-1)/(c^2*d*x^2 - d), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
[Out] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.587 $\int \frac{x(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=177

$$\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2(1-c^2x^2)}{c^2\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] 2*b^2*(-c^2*x^2+1)/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-(-c^2*x^2+1)*(a+b*a
rcsin(c*x))^2/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*a*b*x*(-c^2*x^2+1)^(1/
2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.26, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {4823, 4767, 4715, 267}

$$-\frac{(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{c^2\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2x\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)}{c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2(1-c^2x^2)}{c^2\sqrt{cdx+d}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*(1
 - c^2*x^2))/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*x*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx=\frac{\sqrt{1-c^2x^2}\,\int \frac{x\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$=-\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c^2\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int \left(a+b\sin^{-1}(cx)\right)\,dx}{c\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$=\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(cx)\right)^2}{c^2\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int \mathrm{s}\ldots}{c\sqrt{d+cdx}\,\sqrt{e}\ldots}$$

$$=\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{c\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{\left(1-c^2x^2\right)\left(a+b\sin^{-1}(\ldots\right.}{c^2\sqrt{d+cdx}\,\sqrt{e-ce\ldots}}$$

$$=\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2b^2\left(1-c^2x^2\right)}{c^2\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2b^2x\sqrt{1-c^2x^2}\,\sin^{-1}(cx)}{c\sqrt{d+cdx}\,\sqrt{e-cex}}\ldots$$

Mathematica [A]
time = 0.29, size = 150, normalized size = 0.85

$$-\frac{\sqrt{d+cdx}\,\sqrt{e-cex}\,\left(2abcx\sqrt{1-c^2x^2}+a^2(-1+c^2x^2)-2b^2(-1+c^2x^2)+2b\left(bcx\sqrt{1-c^2x^2}+a(-1+c^2x^2)\right)\mathrm{ArcSin}(cx)+b^2(-1+c^2x^2)\,\mathrm{ArcSin}(cx)^2\right)}{c^2de(-1+cx)(1+cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*a*b*c*x*Sqrt[1 - c^2*x^2] + a^2*(-1 +
 c^2*x^2) - 2*b^2*(-1 + c^2*x^2) + 2*b*(b*c*x*Sqrt[1 - c^2*x^2] + a*(-1 + c
^2*x^2))*ArcSin[c*x] + b^2*(-1 + c^2*x^2)*ArcSin[c*x]^2))/(c^2*d*e*(-1 + c*
x)*(1 + c*x)))
```

Maple [F]
time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [A]
time = 0.52, size = 157, normalized size = 0.89

$$2\left(\frac{x\arcsin(cx)\,e^{\left(-\frac{1}{2}\right)}}{c\sqrt{d}}+\frac{\sqrt{-c^2x^2+1}\,e^{\left(-\frac{1}{2}\right)}}{c^2\sqrt{d}}\right)b^2+\frac{2\,abxe^{\left(-\frac{1}{2}\right)}}{c\sqrt{d}}-\frac{\sqrt{-c^2dx^2e+de}\,b^2\arcsin(cx)^2\,e^{(-1)}}{c^2d}-\frac{2\,\sqrt{-c^2dx^2e+de}\,ab\arcsin(cx)\,e^{(-1)}}{c^2d}-\frac{\sqrt{-c^2dx^2e+de}\,a^2e^{(-1)}}{c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="maxima")
```

```
[Out] 2*(x*arcsin(c*x)*e^(-1/2)/(c*sqrt(d)) + sqrt(-c^2*x^2 + 1)*e^(-1/2)/(c^2*sq
rt(d)))*b^2 + 2*a*b*x*e^(-1/2)/(c*sqrt(d)) - sqrt(-c^2*d*x^2*e + d*e)*b^2*a
rcsin(c*x)^2*e^(-1)/(c^2*d) - 2*sqrt(-c^2*d*x^2*e + d*e)*a*b*arcsin(c*x)*e^
(-1)/(c^2*d) - sqrt(-c^2*d*x^2*e + d*e)*a^2*e^(-1)/(c^2*d)
```

Fricas [A]
time = 2.31, size = 153, normalized size = 0.86

$$-\frac{\sqrt{cdx+d}\left(2\left(b^2cx\arcsin(cx)+abcx\right)\sqrt{-c^2x^2+1}\,\sqrt{-(cx-1)e}+\left((a^2-2\,b^2)c^2x^2+(b^2c^2x^2-b^2)\arcsin(cx)^2-a^2+2\,b^2+2\,(abc^2x^2-ab)\arcsin(cx)\right)\sqrt{-(cx-1)e}\right)e^{(-1)}}{c^4dx^2-c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="fricas")
```

```
[Out] -sqrt(c*d*x + d)*(2*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt(-c^2*x^2 + 1)*sqrt
(-(c*x - 1)*e) + ((a^2 - 2*b^2)*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*x)^2
 - a^2 + 2*b^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x))*sqrt(-(c*x - 1)*e))*e^(
-1)/(c^4*d*x^2 - c^2*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a+b\,\mathrm{asin}(cx))^2}{\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.588 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=55

$$\frac{\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(
1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {4763, 4737}

$$\frac{\sqrt{1-c^2x^2}\,(a+b\mathrm{ArcSin}(cx))^3}{3bc\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\,\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$
$$= \frac{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^3}{3bc\sqrt{d+cdx}\,\sqrt{e-cex}}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 159 vs. $2(55) = 110$.
time = 0.46, size = 159, normalized size = 2.89

$$\frac{\frac{3ab\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)^2}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{b^2\sqrt{1-c^2x^2}\,\mathrm{ArcSin}(cx)^3}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{3a^2\mathrm{ArcTan}\left(\frac{cx\sqrt{d+cdx}\,\sqrt{e-cex}}{\sqrt{d}\,\sqrt{e}\,(-1+c^2x^2)}\right)}{\sqrt{d}\,\sqrt{e}}}{3c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
[Out] ((3*a*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
+ (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) -
 (3*a^2*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 +
 c^2*x^2))])/(Sqrt[d]*Sqrt[e]))/(3*c)
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [A]
time = 0.50, size = 53, normalized size = 0.96

$$\frac{b^2\arcsin(cx)^3\,e^{\left(-\frac{1}{2}\right)}}{3\,c\sqrt{d}} + \frac{ab\arcsin(cx)^2\,e^{\left(-\frac{1}{2}\right)}}{c\sqrt{d}} + \frac{a^2\arcsin(cx)\,e^{\left(-\frac{1}{2}\right)}}{c\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] 1/3*b^2*arcsin(c*x)^3*e^(-1/2)/(c*sqrt(d)) + a*b*arcsin(c*x)^2*e^(-1/2)/(c*
sqrt(d)) + a^2*arcsin(c*x)*e^(-1/2)/(c*sqrt(d))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-1)/(c^2*d*x^2 - d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{(a + b\operatorname{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.589 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx$

Optimal. Leaf size=287

$$-\frac{2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2ib\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{PolyLog}\left(2,-e^{i\text{ArcSin}}\right.}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

```
[Out] -2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-
(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*I
*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2)
)*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b^2*polylog(3,I*c*x
+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.41, antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.171$, Rules used = {4823, 4803, 4268, 2611, 2320, 6724}

$$\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((
2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])
/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E
^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*Sqrt[1 - c^2*
x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\,\int \frac{(a+b\sin^{-1}(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$
$$= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx, x, \sin^{-1}(cx)\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$
$$= -\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subs}}{}$$
$$= -\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2ib\sqrt{1-c^2x^2}\,(a+b\text{s}}{\sqrt{d+c}}$$
$$= -\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2ib\sqrt{1-c^2x^2}\,(a+b\text{s}}{\sqrt{d+c}}$$
$$= -\frac{2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))^2\tanh^{-1}\left(e^{i\sin^{-1}(cx)}\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2ib\sqrt{1-c^2x^2}\,(a+b\text{s}}{\sqrt{d+c}}$$

Mathematica [A]
time = 0.84, size = 336, normalized size = 1.17

$$\frac{a^2\log(cx)}{\sqrt{d}\,\sqrt{e}} - \frac{a^2\log\left(de+\sqrt{d}\,\sqrt{e}\,\sqrt{d+cdx}\,\sqrt{e-cex}\right)}{\sqrt{d}\,\sqrt{e}} + \frac{2ab\sqrt{1-c^2x^2}\left(\text{ArcSin}(cx)\left(\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\log\left(1+e^{i\text{ArcSin}(cx)}\right)\right)+i\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-i\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{b^2\sqrt{1-c^2x^2}\left(\text{ArcSin}(cx)^2\log\left(1-e^{i\text{ArcSin}(cx)}\right)-\text{ArcSin}(cx)^2\log\left(1+e^{i\text{ArcSin}(cx)}\right)+2i\text{ArcSin}(cx)\text{PolyLog}\left(2,-e^{i\text{ArcSin}(cx)}\right)-2i\text{ArcSin}(cx)\text{PolyLog}\left(2,e^{i\text{ArcSin}(cx)}\right)-2\text{PolyLog}\left(3,-e^{i\text{ArcSin}(cx)}\right)+2\text{PolyLog}\left(3,e^{i\text{ArcSin}(cx)}\right)\right)}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (a^2*Log[c*x])/(Sqrt[d]*Sqrt[e]) - (a^2*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x]])/(Sqrt[d]*Sqrt[e]) + (2*a*b*Sqrt[1 - c^2*x^2]*(ArcS
in[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + I*PolyL
og[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (b^2*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2*Log[1 - E^(I*A
rcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]
*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[
c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[3, E^(I*ArcSin[c*x])]
))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{cdx+d}\,\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="maxima")
```

```
[Out] -a^2*e^(-1/2)*log(2*d*e/abs(x) + 2*sqrt(-c^2*d*x^2*e + d*e)*sqrt(d)*e^(1/2)
/abs(x))/sqrt(d) - sqrt(d)*e^(1/2)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqr
t(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^3*e - d*x*e), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-1)/(c^2*d*x^3 - d*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*x), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.590 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal. Leaf size=214

$$-\frac{ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2bc\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\log(1}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

```
[Out] -(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*c*(a
+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b*c
*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(c
*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
^2)*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.42, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4823, 4771, 4721, 3798, 2221, 2317, 2438}

$$-\frac{(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{x\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2bc\sqrt{1-c^2x^2}\,\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) - ((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(x*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]) + (2*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{d+cdx}\,\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}\,\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x^2\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= -\frac{(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= -\frac{(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\cot(x\right.}{\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{\left(4ibc\right.}{}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2bc\sqrt{1}}{}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2bc\sqrt{1}}{}$$

$$= -\frac{ic\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{(1-c^2x^2)\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{2bc\sqrt{1}}{}$$

Mathematica [A]
time = 0.70, size = 189, normalized size = 0.88

$$\frac{b^2\left(-1+c^2x^2-icx\sqrt{1-c^2x^2}\right)\text{ArcSin}(cx)^2+2b\text{ArcSin}(cx)\left(-a+ac^2x^2+bcx\sqrt{1-c^2x^2}\,\log\left(1-e^{2i\text{ArcSin}(cx)}\right)\right)+a\left(-a+ac^2x^2+2bcx\sqrt{1-c^2x^2}\,\log(cx)\right)-ib^2cx\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)}{x\sqrt{d+cdx}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (b^2*(-1 + c^2*x^2 - I*c*x*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*ArcSin[c*
x]*(-a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2]*Log[1 - E^((2*I)*ArcSin[c*x])]
) + a*(-a + a*c^2*x^2 + 2*b*c*x*Sqrt[1 - c^2*x^2]*Log[c*x]) - I*b^2*c*x*Sqr
t[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(x*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x])
```

Maple [F]
time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\arcsin\left(cx\right)\right)^2}{x^2\sqrt{cdx+d}\,\sqrt{-cex+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="maxima")
```

```
[Out] -((-1)^(-2*c^2*d*x^2*e + 2*d*e)*sqrt(d)*e^(1/2)*log(-2*c^2*d*e + 2*d*e/x^2)
 + sqrt(d)*e^(1/2)*log(x^2 - 1/c^2))*a*b*c*e^(-1)/d + b^2*e^(-1/2)*integrat
e(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/(sqrt(c*x + 1)*sqrt(-c*x + 1
)*x^2), x)/sqrt(d) - 2*sqrt(-c^2*d*x^2*e + d*e)*a*b*arcsin(c*x)*e^(-1)/(d*x
) - sqrt(-c^2*d*x^2*e + d*e)*a^2*e^(-1)/(d*x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-(c*x - 1)*e)*e^(-1)/(c^2*d*x^4 - d*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{x^2 \sqrt{d(cx+1)} \sqrt{-e(cx-1)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))),
x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.591 $\int \frac{x^2(a+b\mathbf{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=295

$$\frac{x(a+b\text{ArcSin}(cx))^2}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{c^3de\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc^3de\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2b\sqrt{1-c^2x^2}\,(}{c}$$

```
[Out] x*(a+b*arcsin(c*x))^2/c^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*(a+b*arcsi
n(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*(
a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^
(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)
^(1/2)/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*b^2*polylog(2,-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(
1/2)
```

Rubi [A]

time = 0.53, antiderivative size = 295, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {4823, 4791, 4737, 4765, 3800, 2221, 2317, 2438}

$$\frac{x(a+b\text{ArcSin}(cx))^2}{c^2de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^3}{3bc^3de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{i\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{c^3de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2b\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^3de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c^3de\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^3*d*e*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E
^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*S
qrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{x^2(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x\right.}{cde\sqrt{d}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\sin^{-1}(cx))^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2\right.}{}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\sin^{-1}(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\,(}{3bc^3de\sqrt{d+}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\sin^{-1}(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\,(}{3bc^3de\sqrt{d+}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\sin^{-1}(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\,(}{3bc^3de\sqrt{d+}}$$

$$= \frac{x(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\sin^{-1}(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\,(}{3bc^3de\sqrt{d+}}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 636 vs. 2(295) = 590.
time = 1.51, size = 636, normalized size = 2.16

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
,x]
```

```
[Out] (3*a^2*c*Sqrt[d]*e*x + 3*a^2*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcTan
[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] +
3*a*b*Sqrt[d]*e*(2*c*x*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*(-ArcSin[c*x]^2 + 2*
(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Log[Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]]))) + b^2*Sqrt[d]*e*((6*I)*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*x
] + 3*c*x*ArcSin[c*x]^2 - (3*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - Sqrt[1 -
c^2*x^2]*ArcSin[c*x]^3 + 12*Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x
])] + 3*Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcSin[c*x])] + 6*Sqrt[1 - c^2*
x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*Pi*Sqrt[1 - c^2*x^2]*Log[
```

```
1 + I*E^(I*ArcSin[c*x])] + 6*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*A
rcSin[c*x])] - 12*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + 3*Pi*Sqrt[
1 - c^2*x^2]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 3*Pi*Sqrt[1 - c^2*x^2]*Log
[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])] - (6*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])]))
/(3*c^3*d^(3/2)*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]
time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="maxima")
```

```
[Out] a^2*(x*e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*c^2*d) - arcsin(c*x)*e^(-3/2)/(c^3*
d^(3/2))) + sqrt(d)*e^(1/2)*integrate((b^2*x^2*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))^2 + 2*a*b*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sq
rt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^4*e^2 - 2*c^2*d^2*x^2*e^2 + d^2*e^2),
 x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*d
*x + d)*sqrt(-(c*x - 1)*e)*e^(-2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)),
 x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d+c\,d\,x\right)}^{3/2}\,{\left(e-c\,e\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.592 $\int \frac{x(a+b\mathbf{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=244

$$\frac{(a+b\text{ArcSin}(cx))^2}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{4ib\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}(}{c^2de\sqrt{d+cdx}\,\sqrt{}}$$

```
[Out] (a+b*arcsin(c*x))^2/c^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+4*I*b*(a+b*arc
sin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d/e/(c*d*
x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)*(-c^2*x^2+1)^(1/2)/c^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b^2*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/e/(c*d*x+d)^(1/
2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.35, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4823, 4767, 4749, 4266, 2317, 2438}

$$\frac{4ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c^2de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{(a+b\text{ArcSin}(cx))^2}{c^2de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{c^2de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{c^2de\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
```

```
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{x(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{1-c^2x^2}\,dx}{cde\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,\right.}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}}\right.}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}}\right.}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))\tan^{-1}\left(e^{i\sin^{-1}}\right.}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

Mathematica [A]
time = 0.69, size = 453, normalized size = 1.86

$$\frac{a^2+2ab\text{ArcSin}(cx)+ib^2\pi\sqrt{1-c^2x^2}\text{ArcSin}(cx)+b^2\text{ArcSin}(cx)^2-b^2\pi\sqrt{1-c^2x^2}\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-2b^2\sqrt{1-c^2x^2}\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right)-b^2\pi\sqrt{1-c^2x^2}\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+2b^2\sqrt{1-c^2x^2}\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right)+b^2\pi\sqrt{1-c^2x^2}\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)+2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)-2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right)+b^2\pi\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right)-2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right)+2ib^2\sqrt{1-c^2x^2}\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{c^2de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x
]
```

```
[Out] (a^2 + 2*a*b*ArcSin[c*x] + I*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + b^2*Arc
Sin[c*x]^2 - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b^2*
Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1
- c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*
x]*Log[1 + I*E^(I*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^2]*Log[-Cos[(Pi + 2
*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]] - 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*
I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*b^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x])
```

Maple [F]
time = 0.83, size = 0, normalized size = 0.00

$$\int \frac{x(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="maxima")
```

```
[Out] sqrt(d)*e^(1/2)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
^2 + 2*a*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt
(-c*x + 1)/(c^4*d^2*x^4*e^2 - 2*c^2*d^2*x^2*e^2 + d^2*e^2), x) + a^2*e^(-1)
/(sqrt(-c^2*d*x^2*e + d*e)*c^2*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="fricas")
```

```
[Out] integral((b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x)*sqrt(c*d*x + d
)*sqrt(-(c*x - 1)*e)*e^(-2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a + b \operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}(-e(cx-1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2)
), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x
)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}{\left(d+c\,d\,x\right)^{3/2}\,\left(e-c\,e\,x\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.593 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=217

$$\frac{x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{i(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2b(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))\log\,(1}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*(-
c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*
d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A]

time = 0.27, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.219$, Rules used = {4763, 4745, 4765, 3800, 2221, 2317, 2438}

$$-\frac{i(1-c^2x^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{x(1-c^2x^2)\,(a+b\text{ArcSin}(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2b(1-c^2x^2)^{3/2}\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{ib^2(1-c^2x^2)^{3/2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{(1-c^2x^2)^{3/2}\int \frac{(a+b\sin^{-1}(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bc(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\sin^{-1}(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\right.}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4ib(1\right.}{}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-}{}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-}{}$$

$$= \frac{x(1-c^2x^2)\,(a+b\sin^{-1}(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-}{}$$

Mathematica [**B**] Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 550 vs. $2(217) = 434$.
time = 0.23, size = 550, normalized size = 2.53

$$\frac{a^2cx + 2abcx\,\text{ArcSin}(cx) + 2ib^2\pi\sqrt{1-c^2x^2}\,\text{ArcSin}(cx) + b^2cx\,\text{ArcSin}(cx)^2 - ib^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)^2 + 4b^2\pi\sqrt{1-c^2x^2}\log\left(1+e^{-i\text{ArcSin}(cx)}\right) + b^2\pi\sqrt{1-c^2x^2}\log\left(1-ie^{i\text{ArcSin}(cx)}\right) + 2b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1-ie^{i\text{ArcSin}(cx)}\right) - b^2\pi\sqrt{1-c^2x^2}\log\left(1+ie^{i\text{ArcSin}(cx)}\right) + 2b^2\sqrt{1-c^2x^2}\,\text{ArcSin}(cx)\log\left(1+ie^{i\text{ArcSin}(cx)}\right) - 4b^2\pi\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) + b^2\pi\sqrt{1-c^2x^2}\log\left(-\cos\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) + 2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)-\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) + 2ab\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{2}\text{ArcSin}(cx)\right)+\sin\left(\frac{1}{2}\text{ArcSin}(cx)\right)\right) - b^2\pi\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{1}{4}(\pi+2\text{ArcSin}(cx))\right)\right) - 2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\text{ArcSin}(cx)}\right) - 2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\text{ArcSin}(cx)}\right)}{cde\sqrt{d+cdx}\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a^2*c*x + 2*a*b*c*x*ArcSin[c*x] + (2*I)*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + b^2*c*x*ArcSin[c*x]^2 - I*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 4*b^2*
Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^
2]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*
x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 4
*b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2
]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
```

```
)] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d*e*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] 2*a*b*x*arcsin(c*x)*e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d) - b^2*e^(-1/2)*inte
grate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*x^2*e - d*e)*sqr
t(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + a^2*x*e^(-1)/(sqrt(-c^2*d*x^2*e +
d*e)*d) - a*b*e^(-3/2)*log(x^2 - 1/c^2)/(c*d^(3/2))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)*e^(-2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}(-e(cx-1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2)),
 x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.594 $\int \frac{(a+b\textbf{ArcSin}(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=548

$$\frac{(a+b\text{ArcSin}(cx))^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{4ib\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)}{de\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(}{de\sqrt{d+cdx}}$$

```
[Out] (a+b*arcsin(c*x))^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+4*I*b*(a+b*arcsin(
c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/
2)/(-c*e*x+e)^(1/2)-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))
*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b*(a+b*arcsin(
c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)
^(1/2)/(-c*e*x+e)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-
c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b^2*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e
)^(1/2)-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x
^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c
^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*
b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1
/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]
time = 0.60, antiderivative size = 548, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {4823, 4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438}

$$\frac{4ib\sqrt{1-c^2x^2}\,\text{ArcTan}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))^2}{de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{(a+b\text{ArcSin}(cx))^2}{de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(-ie^{i\text{ArcSin}(cx)}\right)}{de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{Li}_2\left(ie^{i\text{ArcSin}(cx)}\right)}{de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(-e^{i\text{ArcSin}(cx)}\right)}{de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2b^2\sqrt{1-c^2x^2}\,\text{Li}_3\left(e^{i\text{ArcSin}(cx)}\right)}{de\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d*e*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I
*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{x\sqrt{1-c^2x^2}}\,dx}{de\sqrt{d+cdx}\,\sqrt{e-cex}} - \frac{\left(2bc\sqrt{1-c^2\right.}{de\sqrt{d+}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\,\mathrm{Subst}\left(\int(a+bx)^2\csc(x)\,dx, x, \sin^{-1}\right.}{de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

$$= \frac{\left(a+b\sin^{-1}(cx)\right)^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)\tan^{-1}\left(e^{i\sin^{-1}(c}\right.}{de\sqrt{d+cdx}\,\sqrt{e-cex}}$$

<u>**Mathematica**</u> [A]
time = 3.28, size = 877, normalized size = 1.60

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (-((a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(-1 + c^2*x^2)) + a^2*Sqrt[d]*Sqrt
[e]*Log[c*x] - a^2*Sqrt[d]*Sqrt[e]*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]] + (2*a*b*d*e*(ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x
]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*A
rcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + I*Sqr
t[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*Sqrt[1 - c^2*x^2]*PolyLog
[2, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*d*e*(I*Pi
*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 + Sqrt[1 - c^2*x^2]*ArcSin[c
*x]^2*Log[1 - E^(I*ArcSin[c*x])] - Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcS
in[c*x])] - 2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] -
Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*Arc
```

```
Sin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*Log
[1 + E^(I*ArcSin[c*x])] + Pi*Sqrt[1 - c^2*x^2]*Log[-Cos[(Pi + 2*ArcSin[c*x]
)/4]] + Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (2*I)*Sqrt[
1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c^
2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*Sqrt[1 - c^2*x^2]*PolyLog
[2, I*E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, E
^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*
Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]))/(d^2*e^2)
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(cdx+d)^{\frac{3}{2}}\,(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="maxima")
```

```
[Out] -a^2*(e^(-3/2)*log(2*d*e/abs(x) + 2*sqrt(-c^2*d*x^2*e + d*e)*sqrt(d)*e^(1/2
)/abs(x))/d^(3/2) - e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d)) + sqrt(d)*e^(1/2)*
integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*
x^5*e^2 - 2*c^2*d^2*x^3*e^2 + d^2*x*e^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)*e^(-2)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*x), x
)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.595 $\int \frac{(a+b\text{ArcSin}(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal. Leaf size=396

$$-\frac{(a+b\text{ArcSin}(cx))^2}{dex\sqrt{d+cdx}\,\sqrt{e-cex}}+\frac{2c^2x(a+b\text{ArcSin}(cx))^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{2ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{de\sqrt{d+cdx}\,\sqrt{e-cex}}-\frac{4bc\sqrt{1-c^2x^2}\,(a}{d}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/e/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*c^2*x*(a+b*ar
csin(c*x))^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*I*c*(a+b*arcsin(c*x))^2
*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*b*c*(a+b*arcsin(
c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d
)^(1/2)/(-c*e*x+e)^(1/2)+4*b*c*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(
1/2))^2)*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*b^2*c*po
lylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/
2)/(-c*e*x+e)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x
^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A]

time = 0.60, antiderivative size = 396, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {4823, 4789, 4745, 4765, 3800, 2221, 2317, 2438, 4769, 4504, 4268}

$$-\frac{2ic\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))^2}{de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{4bc\sqrt{1-c^2x^2}\,\log\left(1+e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{4bc\sqrt{1-c^2x^2}\,\tanh^{-1}\left(e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{de\sqrt{cdx+d}\,\sqrt{e-cex}}+\frac{2c^2x(a+b\text{ArcSin}(cx))^2}{de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{(a+b\text{ArcSin}(cx))^2}{dex\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(-e^{2i\text{ArcSin}(cx)}\right)}{de\sqrt{cdx+d}\,\sqrt{e-cex}}-\frac{ib^2c\sqrt{1-c^2x^2}\,\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{de\sqrt{cdx+d}\,\sqrt{e-cex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])^2/(d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])) + (2*c^2*x
*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*c*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*
x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*c*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog
[2, E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\sin^{-1}(cx))^2}{x^2(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\sin^{-1}(cx)}{x(1-c^2x^2)}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2c^2\right.}{}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right.}{}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(4bc\sqrt{1-c^2x^2}\right.}{}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\,(}{de\sqrt{d+cd}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\,(}{de\sqrt{d+cd}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\,(}{de\sqrt{d+cd}}$$

$$= -\frac{(a+b\sin^{-1}(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\sin^{-1}(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}\,(}{de\sqrt{d+cd}}$$

Mathematica [A]
time = 1.58, size = 564, normalized size = 1.42

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x
]
```

```
[Out] (c*Csc[ArcSin[c*x]/2]*Sec[ArcSin[c*x]/2]*(-2*a^2 + 4*a^2*c^2*x^2 - 4*a*b*Ar
cSin[c*x]*Cos[2*ArcSin[c*x]] - 2*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + (2*
I)*b^2*Pi*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - (2*I)*b^2*ArcSin[c*x]^2*Sin[2*Ar
cSin[c*x]] + 4*b^2*Pi*Log[1 + E^((-I)*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] + b^
2*Pi*Log[1 - I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Lo
g[1 - I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - b^2*Pi*Log[1 + I*E^(I*ArcSi
n[c*x])]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])
]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])]*Sin
[2*ArcSin[c*x]] + 2*a*b*Log[c*x]*Sin[2*ArcSin[c*x]] - 4*b^2*Pi*Log[Cos[ArcS
```

```
in[c*x]/2]]*Sin[2*ArcSin[c*x]] + b^2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]*S
in[2*ArcSin[c*x]] + 2*a*b*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[
2*ArcSin[c*x]] + 2*a*b*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[2*A
rcSin[c*x]] - b^2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]*Sin[2*ArcSin[c*x]] -
(2*I)*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - (2*I)*b^2
*PolyLog[2, I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - I*b^2*PolyLog[2, E^((
2*I)*ArcSin[c*x])]*Sin[2*ArcSin[c*x]]))/(4*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])
```

Maple [F]
time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="maxima")
```

```
[Out] a*b*c*(e^(-3/2)*log(c*x + 1)/d^(3/2) + e^(-3/2)*log(c*x - 1)/d^(3/2) + 2*e^
(-3/2)*log(x)/d^(3/2)) + 2*(2*c^2*x*e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d) - e
^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d*x))*a*b*arcsin(c*x) - b^2*e^(-1/2)*integr
ate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*x^4*e - d*x^2*e)*s
qrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + (2*c^2*x*e^(-1)/(sqrt(-c^2*d*x^2
*e + d*e)*d) - e^(-1)/(sqrt(-c^2*d*x^2*e + d*e)*d*x))*a^2
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-(c*x - 1)*e)*e^(-2)/(c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/x**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*x^2),
 x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x^2\,{\left(d+c\,d\,x\right)}^{3/2}\,{\left(e-c\,e\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.596 $\int x^4(d+ex^2)(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=152

$$\frac{b(7c^2d+5e)\sqrt{1-c^2x^2}}{35c^7}-\frac{b(14c^2d+15e)\left(1-c^2x^2\right)^{3/2}}{105c^7}+\frac{b(7c^2d+15e)\left(1-c^2x^2\right)^{5/2}}{175c^7}-\frac{be\left(1-c^2x^2\right)^{7/2}}{49c^7}+\frac{1}{5}dx$$

```
[Out] -1/105*b*(14*c^2*d+15*e)*(-c^2*x^2+1)^(3/2)/c^7+1/175*b*(7*c^2*d+15*e)*(-c^
2*x^2+1)^(5/2)/c^7-1/49*b*e*(-c^2*x^2+1)^(7/2)/c^7+1/5*d*x^5*(a+b*arcsin(c*
x))+1/7*e*x^7*(a+b*arcsin(c*x))+1/35*b*(7*c^2*d+5*e)*(-c^2*x^2+1)^(1/2)/c^7
```

Rubi [A]
time = 0.11, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {14, 4815, 12, 457, 78}

$$\frac{1}{5}dx^5(a+b\text{ArcSin}(cx))+\frac{1}{7}ex^7(a+b\text{ArcSin}(cx))+\frac{b\left(1-c^2x^2\right)^{5/2}(7c^2d+15e)}{175c^7}-\frac{b\left(1-c^2x^2\right)^{3/2}(14c^2d+15e)}{105c^7}+\frac{b\sqrt{1-c^2x^2}\,(7c^2d+5e)}{35c^7}-\frac{be\left(1-c^2x^2\right)^{7/2}}{49c^7}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(7*c^2*d + 5*e)*Sqrt[1 - c^2*x^2])/(35*c^7) - (b*(14*c^2*d + 15*e)*(1 -
c^2*x^2)^(3/2))/(105*c^7) + (b*(7*c^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c
^7) - (b*e*(1 - c^2*x^2)^(7/2))/(49*c^7) + (d*x^5*(a + b*ArcSin[c*x]))/5 +
(e*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^4\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{x^5(7d+5ex}{35\sqrt{1-c^2x}}$$

$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{35}(bc)\int\frac{x^5(7d+5}{\sqrt{1-c^2}}$$

$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bc)\text{Subst}\left(\int\frac{x^2}{\sqrt{}}\right.$$

$$=\frac{1}{5}dx^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}ex^7\left(a+b\sin^{-1}(cx)\right)-\frac{1}{70}(bc)\text{Subst}\left(\int\left(\right.\right.$$

$$=\frac{b(7c^2d+5e)\sqrt{1-c^2x^2}}{35c^7}-\frac{b(14c^2d+15e)\left(1-c^2x^2\right)^{3/2}}{105c^7}+\frac{b(7c^2d+15}{}$$

Mathematica [A]
time = 0.08, size = 115, normalized size = 0.76

$$\frac{105ax^5(7d+5ex^2)+\frac{b\sqrt{1-c^2x^2}\,(240e+8c^2(49d+15ex^2)+2c^4(98dx^2+45ex^4)+3c^6(49dx^4+25ex^6))}{c^7}+105bx^5(7d+5ex^2)\,\text{ArcSin}(cx)}{3675}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (105*a*x^5*(7*d + 5*e*x^2) + (b*Sqrt[1 - c^2*x^2]*(240*e + 8*c^2*(49*d + 15
*e*x^2) + 2*c^4*(98*d*x^2 + 45*e*x^4) + 3*c^6*(49*d*x^4 + 25*e*x^6)))/c^7 +
 105*b*x^5*(7*d + 5*e*x^2)*ArcSin[c*x])/3675
```

Maple [A]
time = 0.20, size = 201, normalized size = 1.32

method	result
derivativedivides	$\frac{a\left(\frac{1}{5}d\,c^7x^5+\frac{1}{7}e\,c^7x^7\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)d\,c^7x^5}{5}+\frac{\arcsin(cx)e\,c^7x^7}{7}-\frac{d\,c^2\left(-\frac{c^4x^4\sqrt{-c^2x^2+1}}{5}-\frac{4c^2x^2\sqrt{-c^2x^2+1}}{15}-\frac{8}{}\right.}{5}\right.}{}$
default	$\frac{a\left(\frac{1}{5}d\,c^7x^5+\frac{1}{7}e\,c^7x^7\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)d\,c^7x^5}{5}+\frac{\arcsin(cx)e\,c^7x^7}{7}-\frac{d\,c^2\left(-\frac{c^4x^4\sqrt{-c^2x^2+1}}{5}-\frac{4c^2x^2\sqrt{-c^2x^2+1}}{15}-\frac{8}{}\right.}{5}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(a/c^2*(1/5*d*c^7*x^5+1/7*e*c^7*x^7)+b/c^2*(1/5*arcsin(c*x)*d*c^7*x^5
+1/7*arcsin(c*x)*e*c^7*x^7-1/5*d*c^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*
c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-1/7*e*(-1/7*c^6*x^6*(-c
^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(
1/2)-16/35*(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.49, size = 185, normalized size = 1.22

$$\frac{1}{7}ax^7e+\frac{1}{5}adx^5+\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd+\frac{1}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)be$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*x^7*e + 1/5*a*d*x^5 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1
)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d
 + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*
x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8
)*c)*b*e
```

Fricas [A]
time = 2.47, size = 131, normalized size = 0.86

$$\frac{525\,ac^7x^7e+735\,ac^7dx^5+105\,(5\,bc^7x^7e+7\,bc^7dx^5)\arcsin(cx)+(147\,bc^6dx^4+196\,bc^4dx^2+392\,bc^2d+15\,(5\,bc^6x^6+6\,bc^4x^4+8\,bc^2x^2+16\,b)e)\sqrt{-c^2x^2+1}}{3675\,c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3675*(525*a*c^7*x^7*e + 735*a*c^7*d*x^5 + 105*(5*b*c^7*x^7*e + 7*b*c^7*d*
x^5)*arcsin(c*x) + (147*b*c^6*d*x^4 + 196*b*c^4*d*x^2 + 392*b*c^2*d + 15*(5
*b*c^6*x^6 + 6*b*c^4*x^4 + 8*b*c^2*x^2 + 16*b)*e)*sqrt(-c^2*x^2 + 1))/c^7
```

Sympy [A]
time = 0.75, size = 223, normalized size = 1.47

$$\begin{cases} \frac{adx^5}{5} + \frac{aex^7}{7} + \frac{bdx^5 \operatorname{asin}(cx)}{5} + \frac{bex^7 \operatorname{asin}(cx)}{7} + \frac{bdx^4\sqrt{-c^2x^2+1}}{25c} + \frac{bex^6\sqrt{-c^2x^2+1}}{49c} + \frac{4bdx^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{6bex^4\sqrt{-c^2x^2+1}}{245c^3} + \frac{8bd\sqrt{-c^2x^2+1}}{75c^5} + \frac{8bex^2\sqrt{-c^2x^2+1}}{245c^5} + \frac{16be\sqrt{-c^2x^2+1}}{245c^7} & \text{for } c \neq 0 \\ a\left(\frac{dx^5}{5} + \frac{ex^7}{7}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**5/5 + a*e*x**7/7 + b*d*x**5*asin(c*x)/5 + b*e*x**7*asin(c
*x)/7 + b*d*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e*x**6*sqrt(-c**2*x**2 + 1
)/(49*c) + 4*b*d*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 6*b*e*x**4*sqrt(-c**
2*x**2 + 1)/(245*c**3) + 8*b*d*sqrt(-c**2*x**2 + 1)/(75*c**5) + 8*b*e*x**2*
sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e*sqrt(-c**2*x**2 + 1)/(245*c**7), N
e(c, 0)), (a*(d*x**5/5 + e*x**7/7), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 316 vs. 2(132) = 264.
time = 0.45, size = 316, normalized size = 2.08

$$\frac{1}{7}aex^7 + \frac{1}{5}adx^5 + \frac{(c^2x^2-1)^2 bdx \arcsin(cx)}{5c^4} + \frac{2(c^2x^2-1)bdx \arcsin(cx)}{5c^4} + \frac{(c^2x^2-1)^3 bex \arcsin(cx)}{7c^6} + \frac{bdx \arcsin(cx)}{5c^4} + \frac{3(c^2x^2-1)^2 bex \arcsin(cx)}{7c^6} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd}{25c^5} + \frac{3(c^2x^2-1)bex \arcsin(cx)}{7c^6} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bd}{15c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,be}{49c^7} + \frac{bex \arcsin(cx)}{7c^6} + \frac{\sqrt{-c^2x^2+1}\,bd}{5c^5} + \frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be}{35c^7} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be}{7c^7} + \frac{\sqrt{-c^2x^2+1}\,be}{7c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*e*x^7 + 1/5*a*d*x^5 + 1/5*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^4 + 2/5
*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2 - 1)^3*b*e*x*arcsin(c*x
)/c^6 + 1/5*b*d*x*arcsin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*e*x*arcsin(c*x)/c
^6 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 3/7*(c^2*x^2 - 1)*b*
e*x*arcsin(c*x)/c^6 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*d/c^5 + 1/49*(c^2*x^2 - 1
)^3*sqrt(-c^2*x^2 + 1)*b*e/c^7 + 1/7*b*e*x*arcsin(c*x)/c^6 + 1/5*sqrt(-c^2*
x^2 + 1)*b*d/c^5 + 3/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e/c^7 - 1/7*(-
c^2*x^2 + 1)^(3/2)*b*e/c^7 + 1/7*sqrt(-c^2*x^2 + 1)*b*e/c^7
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] int(x^4*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.597 $\int x^3(d+ex^2)(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=149

$$\frac{b(9c^2d+5e)\,x\sqrt{1-c^2x^2}}{96c^5}+\frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}-\frac{b(9c^2d+5e)\,\text{ArcSin}(cx)}{96c^6}+\frac{1}{4}dx^4($$

```
[Out] -1/96*b*(9*c^2*d+5*e)*arcsin(c*x)/c^6+1/4*d*x^4*(a+b*arcsin(c*x))+1/6*e*x^6
*(a+b*arcsin(c*x))+1/96*b*(9*c^2*d+5*e)*x*(-c^2*x^2+1)^(1/2)/c^5+1/144*b*(9
*c^2*d+5*e)*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e*x^5*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.09, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {14, 4815, 12, 470, 327, 222}

$$\frac{1}{4}dx^4(a+b\text{ArcSin}(cx))+\frac{1}{6}ex^6(a+b\text{ArcSin}(cx))-\frac{b\text{ArcSin}(cx)\,(9c^2d+5e)}{96c^6}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{bx\sqrt{1-c^2x^2}\,(9c^2d+5e)}{96c^5}+\frac{bx^3\sqrt{1-c^2x^2}\,(9c^2d+5e)}{144c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(9*c^2*d + 5*e)*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (b*(9*c^2*d + 5*e)*x^3*S
qrt[1 - c^2*x^2])/(144*c^3) + (b*e*x^5*Sqrt[1 - c^2*x^2])/(36*c) - (b*(9*c^
2*d + 5*e)*ArcSin[c*x])/(96*c^6) + (d*x^4*(a + b*ArcSin[c*x]))/4 + (e*x^6*(
a + b*ArcSin[c*x]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
```

```
x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^3 \left(d+ex^2\right) \left(a+b\sin^{-1}(cx)\right) \, dx = \frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\sin^{-1}(cx)\right)-(bc)\int \frac{x^4(3d+2ex}{12\sqrt{1-c^2x}$$

$$= \frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\sin^{-1}(cx)\right)-\frac{1}{12}(bc)\int \frac{x^4(3d+2}{\sqrt{1-c^2}}$$

$$= \frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\sin^{-1}(cx)\right)-$$

$$= \frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{1}{4}dx^4\left(a+b\sin^{-1}(cx\right)$$

$$= \frac{b(9c^2d+5e)\,x\sqrt{1-c^2x^2}}{96c^5}+\frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-}}{36c}$$

$$= \frac{b(9c^2d+5e)\,x\sqrt{1-c^2x^2}}{96c^5}+\frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-}}{36c}$$

Mathematica [A]
time = 0.06, size = 116, normalized size = 0.78

$$\frac{24ac^6x^4(3d+2ex^2)+bcx\sqrt{1-c^2x^2}\left(15e+c^2(27d+10ex^2)+2c^4(9dx^2+4ex^4)\right)+3b(-9c^2d-5e+8c^6(3dx^4+2ex^6))\,\mathrm{ArcSin}(cx)}{288c^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*a*c^6*x^4*(3*d + 2*e*x^2) + b*c*x*Sqrt[1 - c^2*x^2]*(15*e + c^2*(27*d +
 10*e*x^2) + 2*c^4*(9*d*x^2 + 4*e*x^4)) + 3*b*(-9*c^2*d - 5*e + 8*c^6*(3*d*
x^4 + 2*e*x^6))*ArcSin[c*x])/(288*c^6)
```

Maple [A]
time = 0.10, size = 177, normalized size = 1.19

method	result
derivativedivides	$\frac{\frac{a\left(\frac{1}{4}d\,c^6x^4+\frac{1}{6}e\,c^6x^6\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)d\,c^6x^4}{4}+\frac{\arcsin(cx)e\,c^6x^6}{6}-\frac{d\,c^2\left(-\frac{c^3x^3\sqrt{-c^2x^2+1}}{4}-\frac{3cx\sqrt{-c^2x^2+1}}{8}+\frac{3\,\mathrm{arc}}{}\right.}{4}\right.}{}}{c^4}$
default	$\frac{\frac{a\left(\frac{1}{4}d\,c^6x^4+\frac{1}{6}e\,c^6x^6\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)d\,c^6x^4}{4}+\frac{\arcsin(cx)e\,c^6x^6}{6}-\frac{d\,c^2\left(-\frac{c^3x^3\sqrt{-c^2x^2+1}}{4}-\frac{3cx\sqrt{-c^2x^2+1}}{8}+\frac{3\,\mathrm{arc}}{}\right.}{4}\right.}{}}{c^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(a/c^2*(1/4*d*c^6*x^4+1/6*e*c^6*x^6)+b/c^2*(1/4*arcsin(c*x)*d*c^6*x^4
+1/6*arcsin(c*x)*e*c^6*x^6-1/4*d*c^2*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c
*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-1/6*e*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/
2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(
c*x))))
```

Maxima [A]
time = 0.54, size = 165, normalized size = 1.11

$$\frac{1}{6}ax^6e+\frac{1}{4}adx^4+\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}\,x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}\,x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)bd+\frac{1}{288}\left(48x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}\,x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}\,x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}\,x}{c^6}-\frac{15\arcsin(cx)}{c^7}\right)c\right)be$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*x^6*e + 1/4*a*d*x^4 + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)
*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d + 1/288*(
48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*
x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*e
```

Fricas [A]
time = 1.65, size = 126, normalized size = 0.85

$$\frac{48\,ac^6x^6e+72\,ac^6dx^4+3\left(24\,bc^6dx^4-9\,bc^2d+(16\,bc^6x^6-5\,b)e\right)\arcsin(cx)+\left(18\,bc^5dx^3+27\,bc^3dx+(8\,bc^5x^5+10\,bc^3x^3+15\,bcx)e\right)\sqrt{-c^2x^2+1}}{288\,c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*x^6*e + 72*a*c^6*d*x^4 + 3*(24*b*c^6*d*x^4 - 9*b*c^2*d + (1
6*b*c^6*x^6 - 5*b)*e)*arcsin(c*x) + (18*b*c^5*d*x^3 + 27*b*c^3*d*x + (8*b*c
^5*x^5 + 10*b*c^3*x^3 + 15*b*c*x)*e)*sqrt(-c^2*x^2 + 1))/c^6
```

Sympy [A]
time = 0.53, size = 206, normalized size = 1.38

$$\begin{cases} \frac{adx^4}{4} + \frac{aex^6}{6} + \frac{bdx^4 \operatorname{asin}(cx)}{4} + \frac{bex^6 \operatorname{asin}(cx)}{6} + \frac{bdx^3\sqrt{-c^2x^2+1}}{16c} + \frac{bex^5\sqrt{-c^2x^2+1}}{36c} + \frac{3bdx\sqrt{-c^2x^2+1}}{32c^3} + \frac{5bex^3\sqrt{-c^2x^2+1}}{144c^3} - \frac{3bd\operatorname{asin}(cx)}{32c^4} + \frac{5bex\sqrt{-c^2x^2+1}}{96c^5} - \frac{5be\operatorname{asin}(cx)}{96c^6} & \text{for } c \neq 0 \\ a\left(\frac{dx^4}{4} + \frac{ex^6}{6}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**4/4 + a*e*x**6/6 + b*d*x**4*asin(c*x)/4 + b*e*x**6*asin(c
*x)/6 + b*d*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e*x**5*sqrt(-c**2*x**2 + 1
)/(36*c) + 3*b*d*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*e*x**3*sqrt(-c**2*x
**2 + 1)/(144*c**3) - 3*b*d*asin(c*x)/(32*c**4) + 5*b*e*x*sqrt(-c**2*x**2 +
 1)/(96*c**5) - 5*b*e*asin(c*x)/(96*c**6), Ne(c, 0)), (a*(d*x**4/4 + e*x**6
/6), True))
```

Giac [A]
time = 0.40, size = 254, normalized size = 1.70

$$\frac{1}{6}aex^6 + \frac{1}{4}adx^4 - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdx}{16c^3} + \frac{(c^2x^2-1)^2 bd \arcsin(cx)}{4c^4} + \frac{5\sqrt{-c^2x^2+1}\,bdx}{32c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bex}{36c^5} + \frac{(c^2x^2-1)bd\arcsin(cx)}{2c^4} + \frac{(c^2x^2-1)^3 be\arcsin(cx)}{6c^6} - \frac{13(-c^2x^2+1)^{\frac{3}{2}}bex}{144c^5} + \frac{5bd\arcsin(cx)}{32c^4} + \frac{(c^2x^2-1)^2 be\arcsin(cx)}{2c^6} + \frac{11\sqrt{-c^2x^2+1}\,bex}{96c^5} + \frac{(c^2x^2-1)be\arcsin(cx)}{2c^6} + \frac{11be\arcsin(cx)}{96c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/6*a*e*x^6 + 1/4*a*d*x^4 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*x/c^3 + 1/4*(c^2*
x^2 - 1)^2*b*d*arcsin(c*x)/c^4 + 5/32*sqrt(-c^2*x^2 + 1)*b*d*x/c^3 + 1/36*(
c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e*x/c^5 + 1/2*(c^2*x^2 - 1)*b*d*arcsin(
c*x)/c^4 + 1/6*(c^2*x^2 - 1)^3*b*e*arcsin(c*x)/c^6 - 13/144*(-c^2*x^2 + 1)^
(3/2)*b*e*x/c^5 + 5/32*b*d*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*e*arcsin
(c*x)/c^6 + 11/96*sqrt(-c^2*x^2 + 1)*b*e*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e*arcs
in(c*x)/c^6 + 11/96*b*e*arcsin(c*x)/c^6
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.598 $\int x^2(d+ex^2)(a+b\text{ArcSin}(cx))\,dx$

Optimal. Leaf size=120

$$\frac{b(5c^2d+3e)\sqrt{1-c^2x^2}}{15c^5}-\frac{b(5c^2d+6e)(1-c^2x^2)^{3/2}}{45c^5}+\frac{be(1-c^2x^2)^{5/2}}{25c^5}+\frac{1}{3}dx^3(a+b\text{ArcSin}(cx))+\frac{1}{5}ex^5(a+b\text{A}$$

```
[Out] -1/45*b*(5*c^2*d+6*e)*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e*(-c^2*x^2+1)^(5/2)/c^
5+1/3*d*x^3*(a+b*arcsin(c*x))+1/5*e*x^5*(a+b*arcsin(c*x))+1/15*b*(5*c^2*d+3
*e)*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A]
time = 0.09, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4815, 12, 457, 78}

$$\frac{1}{3}dx^3(a+b\text{ArcSin}(cx))+\frac{1}{5}ex^5(a+b\text{ArcSin}(cx))-\frac{b(1-c^2x^2)^{3/2}(5c^2d+6e)}{45c^5}+\frac{b\sqrt{1-c^2x^2}(5c^2d+3e)}{15c^5}+\frac{be(1-c^2x^2)^{5/2}}{25c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(5*c^2*d + 3*e)*Sqrt[1 - c^2*x^2])/(15*c^5) - (b*(5*c^2*d + 6*e)*(1 - c^
2*x^2)^(3/2))/(45*c^5) + (b*e*(1 - c^2*x^2)^(5/2))/(25*c^5) + (d*x^3*(a + b
*ArcSin[c*x]))/3 + (e*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^2\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{x^3(5d+3ex}{15\sqrt{1-c^2x}}$$

$$=\frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{15}(bc)\int\frac{x^3(5d+3}{\sqrt{1-c^2}}$$

$$=\frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bc)\text{Subst}\left(\int\frac{x(}{\sqrt{}}\right.$$

$$=\frac{1}{3}dx^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\sin^{-1}(cx)\right)-\frac{1}{30}(bc)\text{Subst}\left(\int\left(\right.\right.$$

$$=\frac{b(5c^2d+3e)\sqrt{1-c^2x^2}}{15c^5}-\frac{b(5c^2d+6e)\left(1-c^2x^2\right)^{3/2}}{45c^5}+\frac{be\left(1-c^2x^2\right)^5}{25c^5}$$

Mathematica [A]
time = 0.07, size = 96, normalized size = 0.80

$$\frac{1}{225}\left(15ax^3\left(5d+3ex^2\right)+\frac{b\sqrt{1-c^2x^2}\,\left(24e+2c^2\left(25d+6ex^2\right)+c^4\left(25dx^2+9ex^4\right)\right)}{c^5}+15bx^3\left(5d+3ex^2\right)\text{ArcSin}(cx)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*a*x^3*(5*d + 3*e*x^2) + (b*Sqrt[1 - c^2*x^2]*(24*e + 2*c^2*(25*d + 6*e*
x^2) + c^4*(25*d*x^2 + 9*e*x^4)))/c^5 + 15*b*x^3*(5*d + 3*e*x^2)*ArcSin[c*x
])/225
```

Maple [A]
time = 0.11, size = 161, normalized size = 1.34

method	result
derivativedivides	$\frac{\frac{a\left(\frac{1}{3}dc^5x^3+\frac{1}{5}ec^5x^5\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)dc^5x^3}{3}+\frac{\arcsin(cx)ec^5x^5}{5}-\frac{dc^2\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\frac{2\sqrt{-c^2x^2+1}}{3}\right)}{3}-\frac{e\left(-\cdots\right.}{}\right.}{c^2}}{c^3}$
default	$\frac{\frac{a\left(\frac{1}{3}dc^5x^3+\frac{1}{5}ec^5x^5\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)dc^5x^3}{3}+\frac{\arcsin(cx)ec^5x^5}{5}-\frac{dc^2\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\frac{2\sqrt{-c^2x^2+1}}{3}\right)}{3}-\frac{e\left(-\cdots\right.}{}\right.}{c^2}}{c^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(a/c^2*(1/3*d*c^5*x^3+1/5*e*c^5*x^5)+b/c^2*(1/3*arcsin(c*x)*d*c^5*x^3
+1/5*arcsin(c*x)*e*c^5*x^5-1/3*d*c^2*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(
-c^2*x^2+1)^(1/2))-1/5*e*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^
2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.49, size = 144, normalized size = 1.20

$$\frac{1}{5}ax^5e+\frac{1}{3}adx^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd+\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*x^5*e + 1/3*a*d*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*
x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d + 1/75*(15*x^5*arcsin(c*x) + (3*sq
rt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 +
 1)/c^6)*c)*b*e
```

Fricas [A]
time = 0.96, size = 112, normalized size = 0.93

$$\frac{45\,ac^5x^5e+75\,ac^5dx^3+15\left(3\,bc^5x^5e+5\,bc^5dx^3\right)\arcsin(cx)+\left(25\,bc^4dx^2+50\,bc^2d+3\left(3\,bc^4x^4+4\,bc^2x^2+8\,b\right)e\right)\sqrt{-c^2x^2+1}}{225\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*x^5*e + 75*a*c^5*d*x^3 + 15*(3*b*c^5*x^5*e + 5*b*c^5*d*x^3)
*arcsin(c*x) + (25*b*c^4*d*x^2 + 50*b*c^2*d + 3*(3*b*c^4*x^4 + 4*b*c^2*x^2
+ 8*b)*e)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 0.42, size = 172, normalized size = 1.43

$$\begin{cases} \frac{adx^3}{3} + \frac{aex^5}{5} + \frac{bdx^3 \operatorname{asin}(cx)}{3} + \frac{bex^5 \operatorname{asin}(cx)}{5} + \frac{bdx^2\sqrt{-c^2x^2+1}}{9c} + \frac{bex^4\sqrt{-c^2x^2+1}}{25c} + \frac{2bd\sqrt{-c^2x^2+1}}{9c^3} + \frac{4bex^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{8be\sqrt{-c^2x^2+1}}{75c^5} & \text{for } c \neq 0 \\ a\left(\frac{dx^3}{3} + \frac{ex^5}{5}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**3/3 + a*e*x**5/5 + b*d*x**3*asin(c*x)/3 + b*e*x**5*asin(c
*x)/5 + b*d*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*x**4*sqrt(-c**2*x**2 + 1)
/(25*c) + 2*b*d*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*e*x**2*sqrt(-c**2*x**2
+ 1)/(75*c**3) + 8*b*e*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d*x**
3/3 + e*x**5/5), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 210 vs. $2(104) = 208$.
time = 0.40, size = 210, normalized size = 1.75

$$\frac{1}{5}\,aex^5 + \frac{1}{3}\,adx^3 + \frac{(c^2x^2-1)bdx \arcsin(cx)}{3\,c^2} + \frac{bdx \arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)^2 bex \arcsin(cx)}{5\,c^4} + \frac{2\,(c^2x^2-1)bex \arcsin(cx)}{5\,c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}} bd}{9\,c^3} + \frac{bex \arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}\,bd}{3\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be}{25\,c^5} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}} be}{15\,c^5} + \frac{\sqrt{-c^2x^2+1}\,be}{5\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*e*x^5 + 1/3*a*d*x^3 + 1/3*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^2 + 1/3*b
*d*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e*x*arcsin(c*x)/c^4 + 2/5*(c^2
*x^2 - 1)*b*e*x*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d/c^3 + 1/5*b*
e*x*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*d/c^3 + 1/25*(c^2*x^2 - 1)^2
*sqrt(-c^2*x^2 + 1)*b*e/c^5 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e/c^5 + 1/5*sqrt(
-c^2*x^2 + 1)*b*e/c^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.599 $\int x(d+ex^2)\left(a+b\mathbf{ArcSin}(cx)\right)dx$

Optimal. Leaf size=122

$$\frac{3b(2c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3}+\frac{bx\sqrt{1-c^2x^2}\,(d+ex^2)}{16c}-\frac{b(8c^4d^2+8c^2de+3e^2)\,\mathrm{ArcSin}(cx)}{32c^4e}+\frac{(d+ex^2)^2\,(a+b}{4e}$$

```
[Out] -1/32*b*(8*c^4*d^2+8*c^2*d*e+3*e^2)*arcsin(c*x)/c^4/e+1/4*(e*x^2+d)^2*(a+b*
arcsin(c*x))/e+3/32*b*(2*c^2*d+e)*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*x*(e*x^2+
d)*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]

time = 0.07, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.235$, Rules used = {4813, 427, 396, 222}

$$\frac{(d+ex^2)^2\,(a+b\mathrm{ArcSin}(cx))}{4e}-\frac{b\mathrm{ArcSin}(cx)\,(8c^4d^2+8c^2de+3e^2)}{32c^4e}+\frac{bx\sqrt{1-c^2x^2}\,(d+ex^2)}{16c}+\frac{3bx\sqrt{1-c^2x^2}\,(2c^2d+e)}{32c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2])/(32*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(
d + e*x^2))/(16*c) - (b*(8*c^4*d^2 + 8*c^2*d*e + 3*e^2)*ArcSin[c*x])/(32*c^
4*e) + ((d + e*x^2)^2*(a + b*ArcSin[c*x]))/(4*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 427

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[d*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q - 1)/(b*(n*(p + q) + 1))),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^2}{\sqrt{1-c^2x^2}}\,dx}{4e}$$
$$=\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)}{16c}+\frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{4e}+\frac{b\int\frac{-d(4c^2d+e)-}{\sqrt{1-}}}{16}$$
$$=\frac{3b(2c^2d+e)x\sqrt{1-c^2x^2}}{32c^3}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)}{16c}+\frac{\left(d+ex^2\right)^2(a+}{4e}$$
$$=\frac{3b(2c^2d+e)x\sqrt{1-c^2x^2}}{32c^3}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)}{16c}-\frac{b(8c^4d^2+8c^2de}{32}$$

Mathematica [A]
time = 0.05, size = 95, normalized size = 0.78

$$\frac{cx\left(8ac^3x(2d+ex^2)+b\sqrt{1-c^2x^2}\left(3e+2c^2(4d+ex^2)\right)\right)+b(-8c^2d-3e+8c^4(2dx^2+ex^4))\,\text{ArcSin}(cx)}{32c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
[Out] (c*x*(8*a*c^3*x*(2*d + e*x^2) + b*Sqrt[1 - c^2*x^2]*(3*e + 2*c^2*(4*d + e*x
^2))) + b*(-8*c^2*d - 3*e + 8*c^4*(2*d*x^2 + e*x^4))*ArcSin[c*x])/(32*c^4)
```

Maple [A]
time = 0.14, size = 172, normalized size = 1.41

method	result
derivativedivides	$\frac{\frac{\left(c^2ex^2+c^2d\right)^2a}{4c^2e}+\frac{b\left(\frac{\arcsin(cx)c^4d^2}{4e}+\frac{\arcsin(cx)c^4dx^2}{2}+\frac{e\arcsin(cx)c^4x^4}{4}-\frac{c^4d^2\arcsin(cx)+2dc^2e\left(-\frac{cx\sqrt{-c^2x^2+1}}{2}+\frac{\arcsi}{}\right.}{}\right.}{c^2}}{c^2}$

default	$\frac{\frac{(c^2e\,x^2+c^2d)^2 a}{4c^2e}+\frac{b\left(\frac{\arcsin(cx)c^4d^2}{4e}+\frac{\arcsin(cx)c^4d\,x^2}{2}+\frac{e\arcsin(cx)c^4x^4}{4}-\frac{c^4d^2\arcsin(cx)+2d\,c^2e\left(-\frac{cx\sqrt{-c^2x^2+1}}{2}+\text{arc}\right.}{}\right.}{c^2}}{c^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/4*(c^2*e*x^2+c^2*d)^2*a/c^2/e+b/c^2*(1/4/e*arcsin(c*x)*c^4*d^2+1/2
*arcsin(c*x)*c^4*d*x^2+1/4*e*arcsin(c*x)*c^4*x^4-1/4/e*(c^4*d^2*arcsin(c*x)
+2*d*c^2*e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+e^2*(-1/4*c^3*x^3*
(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x)))))
```

Maxima [A]
time = 0.48, size = 124, normalized size = 1.02

$$\frac{1}{4}\,ax^4e+\frac{1}{2}\,adx^2+\frac{1}{4}\left(2\,x^2\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x}{c^2}-\frac{\arcsin\left(cx\right)}{c^3}\right)\right)bd+\frac{1}{32}\left(8\,x^4\arcsin\left(cx\right)+\left(\frac{2\,\sqrt{-c^2x^2+1}\,x^3}{c^2}+\frac{3\,\sqrt{-c^2x^2+1}\,x}{c^4}-\frac{3\,\arcsin\left(cx\right)}{c^5}\right)c\right)be$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4*e + 1/2*a*d*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*
x/c^2 - arcsin(c*x)/c^3))*b*d + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2
+ 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e
```

Fricas [A]
time = 1.03, size = 106, normalized size = 0.87

$$\frac{8\,ac^4x^4e+16\,ac^4dx^2+\left(16\,bc^4dx^2-8\,bc^2d+\left(8\,bc^4x^4-3\,b\right)e\right)\arcsin\left(cx\right)+\left(8\,bc^3dx+\left(2\,bc^3x^3+3\,bcx\right)e\right)\sqrt{-c^2x^2+1}}{32\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/32*(8*a*c^4*x^4*e + 16*a*c^4*d*x^2 + (16*b*c^4*d*x^2 - 8*b*c^2*d + (8*b*c
^4*x^4 - 3*b)*e)*arcsin(c*x) + (8*b*c^3*d*x + (2*b*c^3*x^3 + 3*b*c*x)*e)*sq
rt(-c^2*x^2 + 1))/c^4
```

Sympy [A]
time = 0.28, size = 153, normalized size = 1.25

$$\begin{cases}\frac{adx^2}{2}+\frac{aex^4}{4}+\frac{bdx^2\operatorname{asin}(cx)}{2}+\frac{bex^4\operatorname{asin}(cx)}{4}+\frac{bdx\sqrt{-c^2x^2+1}}{4c}+\frac{bex^3\sqrt{-c^2x^2+1}}{16c}-\frac{bd\operatorname{asin}(cx)}{4c^2}+\frac{3bex\sqrt{-c^2x^2+1}}{32c^3}-\frac{3be\operatorname{asin}(cx)}{32c^4} & \text{for } c\neq 0\\ a\left(\frac{dx^2}{2}+\frac{ex^4}{4}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**2/2 + a*e*x**4/4 + b*d*x**2*asin(c*x)/2 + b*e*x**4*asin(c
*x)/4 + b*d*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*x**3*sqrt(-c**2*x**2 + 1)/(1
6*c) - b*d*asin(c*x)/(4*c**2) + 3*b*e*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*
b*e*asin(c*x)/(32*c**4), Ne(c, 0)), (a*(d*x**2/2 + e*x**4/4), True))
```

Giac [A]
time = 0.43, size = 168, normalized size = 1.38

$$\frac{1}{4}\,aex^4+\frac{\sqrt{-c^2x^2+1}\,bdx}{4\,c}+\frac{(c^2x^2-1)bd\arcsin(cx)}{2\,c^2}-\frac{(-c^2x^2+1)^{\frac{3}{2}}bex}{16\,c^3}+\frac{(c^2x^2-1)ad}{2\,c^2}+\frac{bd\arcsin(cx)}{4\,c^2}+\frac{(c^2x^2-1)^2be\arcsin(cx)}{4\,c^4}+\frac{5\,\sqrt{-c^2x^2+1}\,bex}{32\,c^3}+\frac{(c^2x^2-1)be\arcsin(cx)}{2\,c^4}+\frac{5\,be\arcsin(cx)}{32\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*a*e*x^4 + 1/4*sqrt(-c^2*x^2 + 1)*b*d*x/c + 1/2*(c^2*x^2 - 1)*b*d*arcsin
(c*x)/c^2 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e*x/c^3 + 1/2*(c^2*x^2 - 1)*a*d/c^2
 + 1/4*b*d*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*arcsin(c*x)/c^4 + 5/32
*sqrt(-c^2*x^2 + 1)*b*e*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e*arcsin(c*x)/c^4 + 5/3
2*b*e*arcsin(c*x)/c^4
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.600 $\int (d+ex^2) (a+b\text{ArcSin}(cx)) \, dx$

Optimal. Leaf size=81

$$\frac{b(3c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{be(1-c^2x^2)^{3/2}}{9c^3}+dx(a+b\text{ArcSin}(cx))+\frac{1}{3}ex^3(a+b\text{ArcSin}(cx))$$

```
[Out] -1/9*b*e*(-c^2*x^2+1)^(3/2)/c^3+d*x*(a+b*arcsin(c*x))+1/3*e*x^3*(a+b*arcsin
(c*x))+1/3*b*(3*c^2*d+e)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A]
time = 0.05, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {4755, 455, 45}

$$dx(a+b\text{ArcSin}(cx))+\frac{1}{3}ex^3(a+b\text{ArcSin}(cx))+\frac{b\sqrt{1-c^2x^2}\,(3c^2d+e)}{3c^3}-\frac{be(1-c^2x^2)^{3/2}}{9c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(3*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e*(1 - c^2*x^2)^(3/2))/(9*
c^3) + d*x*(a + b*ArcSin[c*x]) + (e*x^3*(a + b*ArcSin[c*x]))/3
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\int (d+ex^2)\left(a+b\sin^{-1}(cx)\right)\,dx = dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)-(bc)\int\frac{x\left(d+\frac{ex^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx$$
$$= dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bc)\text{Subst}\left(\int\frac{d+\frac{ex}{3}}{\sqrt{1-c^2\ldots}}\right.$$
$$= dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)-\frac{1}{2}(bc)\text{Subst}\left(\int\left(\frac{3c^2\ldots}{3c^2\sqrt{1\ldots}}\right.\right.$$
$$= \frac{b(3c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{be(1-c^2x^2)^{3/2}}{9c^3}+dx\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}ex^3\ldots$$

Mathematica [A]
time = 0.05, size = 71, normalized size = 0.88

$$\frac{1}{9}\left(3ax\left(3d+ex^2\right)+\frac{b\sqrt{1-c^2x^2}\,\left(2e+c^2(9d+ex^2)\right)}{c^3}+3bx\left(3d+ex^2\right)\text{ArcSin}(cx)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x]),x]
[Out] (3*a*x*(3*d + e*x^2) + (b*Sqrt[1 - c^2*x^2]*(2*e + c^2*(9*d + e*x^2)))/c^3
+ 3*b*x*(3*d + e*x^2)*ArcSin[c*x])/9
```

Maple [A]
time = 0.01, size = 111, normalized size = 1.37

method	result
derivativedivides	$\frac{\frac{a\left(d\,c^3x+\frac{1}{3}e\,c^3x^3\right)}{c^2}+\frac{b\left(\arcsin(cx)d\,c^3x+\frac{\arcsin(cx)e\,c^3x^3}{3}+d\,c^2\sqrt{-c^2x^2+1}-\frac{e\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\frac{2\sqrt{-c^2x^2\ldots}}{3}\right.}{3}\ldots\right.}{c^2}}{c}$
default	$\frac{\frac{a\left(d\,c^3x+\frac{1}{3}e\,c^3x^3\right)}{c^2}+\frac{b\left(\arcsin(cx)d\,c^3x+\frac{\arcsin(cx)e\,c^3x^3}{3}+d\,c^2\sqrt{-c^2x^2+1}-\frac{e\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\frac{2\sqrt{-c^2x^2\ldots}}{3}\right.}{3}\ldots\right.}{c^2}}{c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/c^2*(d*c^3*x+1/3*e*c^3*x^3)+b/c^2*(arcsin(c*x)*d*c^3*x+1/3*arcsin(c*
x)*e*c^3*x^3+d*c^2*(-c^2*x^2+1)^(1/2)-1/3*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2
)-2/3*(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.48, size = 93, normalized size = 1.15

$$\frac{1}{3}ax^3e + adx + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/3*a*x^3*e + a*d*x + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))
*b*d/c
```

Fricas [A]
time = 1.11, size = 86, normalized size = 1.06

$$\frac{3ac^3x^3e + 9ac^3dx + 3(bc^3x^3e + 3bc^3dx)\arcsin(cx) + (9bc^2d + (bc^2x^2 + 2b)e)\sqrt{-c^2x^2+1}}{9c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*a*c^3*x^3*e + 9*a*c^3*d*x + 3*(b*c^3*x^3*e + 3*b*c^3*d*x)*arcsin(c*x
) + (9*b*c^2*d + (b*c^2*x^2 + 2*b)*e)*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A]
time = 0.17, size = 109, normalized size = 1.35

$$\begin{cases} adx + \frac{aex^3}{3} + bdx\operatorname{asin}(cx) + \frac{bex^3\operatorname{asin}(cx)}{3} + \frac{bd\sqrt{-c^2x^2+1}}{c} + \frac{bex^2\sqrt{-c^2x^2+1}}{9c} + \frac{2be\sqrt{-c^2x^2+1}}{9c^3} & \text{for } c \neq 0 \\ a\left(dx + \frac{ex^3}{3}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x + a*e*x**3/3 + b*d*x*asin(c*x) + b*e*x**3*asin(c*x)/3 + b*
d*sqrt(-c**2*x**2 + 1)/c + b*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 2*b*e*sqrt
(-c**2*x**2 + 1)/(9*c**3), Ne(c, 0)), (a*(d*x + e*x**3/3), True))
```

Giac [A]
time = 0.42, size = 109, normalized size = 1.35

$$\frac{1}{3}aex^3 + bdx\arcsin(cx) + adx + \frac{(c^2x^2-1)bex\arcsin(cx)}{3c^2} + \frac{bex\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}\,bd}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be}{9c^3} + \frac{\sqrt{-c^2x^2+1}\,be}{3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/3*a*e*x^3 + b*d*x*arcsin(c*x) + a*d*x + 1/3*(c^2*x^2 - 1)*b*e*x*arcsin(c*
x)/c^2 + 1/3*b*e*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d/c - 1/9*(-c^2*x
^2 + 1)^(3/2)*b*e/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e/c^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\begin{cases} b\,e\,\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}(c\,x)}{3}\right)+\frac{a\,x\,\left(e\,x^2+3\,d\right)}{3}+\frac{b\,d\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if } 0<c \\ \int (a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)\,dx & \text{if } \neg 0<c \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] piecewise(0 < c, b*e*(((1/c^2 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x
))/3) + (a*x*(3*d + e*x^2))/3 + (b*d*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)
))/c, ~0 < c, int((a + b*asin(c*x))*(d + e*x^2), x))
```

3.601 $\int \frac{(d+ex^2)(a+b\text{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=132

$$\frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\text{ArcSin}(cx)}{4c^2}-\frac{1}{2}ibd\text{ArcSin}(cx)^2+\frac{1}{2}ex^2(a+b\text{ArcSin}(cx))+bd\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(c}\right.$$

```
[Out] -1/4*b*e*arcsin(c*x)/c^2-1/2*I*b*d*arcsin(c*x)^2+1/2*e*x^2*(a+b*arcsin(c*x)
)+b*d*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*d*arcsin(c*x)*ln(x)+
d*(a+b*arcsin(c*x))*ln(x)-1/2*I*b*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)
+1/4*b*e*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.18, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 12, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.632$, Rules used = {14, 4815, 12, 6874, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$d\log(x)(a+b\text{ArcSin}(cx))+\frac{1}{2}ex^2(a+b\text{ArcSin}(cx))-\frac{be\text{ArcSin}(cx)}{4c^2}-\frac{1}{2}ibd\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{2}ibd\text{ArcSin}(cx)^2+bd\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-bd\log(x)\text{ArcSin}(cx)+\frac{bex\sqrt{1-c^2x^2}}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (b*e*x*Sqrt[1 - c^2*x^2])/(4*c) - (b*e*ArcSin[c*x])/(4*c^2) - (I/2)*b*d*Arc
Sin[c*x]^2 + (e*x^2*(a + b*ArcSin[c*x]))/2 + b*d*ArcSin[c*x]*Log[1 - E^((2*
I)*ArcSin[c*x])] - b*d*ArcSin[c*x]*Log[x] + d*(a + b*ArcSin[c*x])*Log[x] -
(I/2)*b*d*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
```

```
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
```

```
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex^2)\,(a+b\sin^{-1}(cx))}{x}\,dx &= \frac{1}{2}ex^2\big(a+b\sin^{-1}(cx)\big)+d\big(a+b\sin^{-1}(cx)\big)\log(x)-(bc)\int \frac{ex^2+2d\log}{2\sqrt{1-c^2}} \\
&= \frac{1}{2}ex^2\big(a+b\sin^{-1}(cx)\big)+d\big(a+b\sin^{-1}(cx)\big)\log(x)-\frac{1}{2}(bc)\int \frac{ex^2+2d}{\sqrt{1-c}} \\
&= \frac{1}{2}ex^2\big(a+b\sin^{-1}(cx)\big)+d\big(a+b\sin^{-1}(cx)\big)\log(x)-\frac{1}{2}(bc)\int \Big(\frac{ex^2}{\sqrt{1-c}} \\
&= \frac{1}{2}ex^2\big(a+b\sin^{-1}(cx)\big)+d\big(a+b\sin^{-1}(cx)\big)\log(x)-(bcd)\int \frac{\log(x)}{\sqrt{1-c^2x}} \\
&= \frac{bex\sqrt{1-c^2x^2}}{4c}+\frac{1}{2}ex^2\big(a+b\sin^{-1}(cx)\big)-bd\sin^{-1}(cx)\log(x)+d\big(a+ \\
&= \frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}+\frac{1}{2}ex^2\big(a+b\sin^{-1}(cx)\big)-bd\sin^{-1}(cx)\, \\
&= \frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\big(a+b\sin^{-1}(cx \\
&= \frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\big(a+b\sin^{-1}(cx \\
&= \frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\big(a+b\sin^{-1}(cx \\
&= \frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\sin^{-1}(cx)}{4c^2}-\frac{1}{2}ibd\sin^{-1}(cx)^2+\frac{1}{2}ex^2\big(a+b\sin^{-1}(cx
\end{aligned}$$

Mathematica [A]

time = 0.13, size = 126, normalized size = 0.95

$$\frac{1}{2}\left(aex^2+bex^2\mathrm{ArcSin}(cx)+\frac{be\left(cx\sqrt{1-c^2x^2}-2\mathrm{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{2c^2}+2bd\mathrm{ArcSin}(cx)\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)+2ad\log(x)-ibd\left(\mathrm{ArcSin}(cx)^2+\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (a*e*x^2 + b*e*x^2*ArcSin[c*x] + (b*e*(c*x*Sqrt[1 - c^2*x^2] - 2*ArcTan[(c*
x)/(-1 + Sqrt[1 - c^2*x^2])]))/(2*c^2) + 2*b*d*ArcSin[c*x]*Log[1 - E^((2*I)
*ArcSin[c*x])] + 2*a*d*Log[x] - I*b*d*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*
ArcSin[c*x])]))/2
```

Maple [A]
time = 0.36, size = 167, normalized size = 1.27

method	result
derivativedivides	$\frac{ae\,x^2}{2}+da\ln\left(cx\right)-\frac{ibd\arcsin(cx)^2}{2}+db\arcsin\left(cx\right)\ln\left(1-icx-\sqrt{-c^2x^2+1}\,\right)+db\arcsin($
default	$\frac{ae\,x^2}{2}+da\ln\left(cx\right)-\frac{ibd\arcsin(cx)^2}{2}+db\arcsin\left(cx\right)\ln\left(1-icx-\sqrt{-c^2x^2+1}\,\right)+db\arcsin($

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a*e*x^2+d*a*ln(c*x)-1/2*I*b*d*arcsin(c*x)^2+d*b*arcsin(c*x)*ln(1-I*c*x-
(-c^2*x^2+1)^(1/2))+d*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*d*b*po
lylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)
)-1/4*b/c^2*e*arcsin(c*x)*cos(2*arcsin(c*x))+1/8*b/c^2*e*sin(2*arcsin(c*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/2*a*x^2*e + a*d*log(x) + integrate((b*x^2*e + b*d)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*x^2*e + a*d + (b*x^2*e + b*d)*arcsin(c*x))/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(a+b\operatorname{asin}(cx))\,(d+ex^2)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)/x, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2))/x, x)
```

3.602 $\int \frac{(d+ex^2)(a+b\mathbf{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=66

$$\frac{be\sqrt{1-c^2x^2}}{c}-\frac{d(a+b\text{ArcSin}(cx))}{x}+ex(a+b\text{ArcSin}(cx))-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -d*(a+b*arcsin(c*x))/x+e*x*(a+b*arcsin(c*x))-b*c*d*arctanh((-c^2*x^2+1)^(1/
2))+b*e*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.06, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}=0.316$, Rules used = {14, 4815, 457, 81, 65, 214}

$$-\frac{d(a+b\text{ArcSin}(cx))}{x}+ex(a+b\text{ArcSin}(cx))-bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be\sqrt{1-c^2x^2}}{c}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*Sqrt[1 - c^2*x^2])/c - (d*(a + b*ArcSin[c*x]))/x + e*x*(a + b*ArcSin[c
*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 81

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[b*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/(d*f*(n + p +
 2))), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)\left(a+b\sin^{-1}(cx)\right)}{x^2}\,dx = -\frac{d(a+b\sin^{-1}(cx))}{x} + ex\left(a+b\sin^{-1}(cx)\right) - (bc)\int \frac{-d+ex^2}{x\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{x} + ex\left(a+b\sin^{-1}(cx)\right) - \frac{1}{2}(bc)\text{Subst}\left(\int \frac{-d+ex}{x\sqrt{1-c^2x}}\right.$$

$$= \frac{be\sqrt{1-c^2x^2}}{c} - \frac{d(a+b\sin^{-1}(cx))}{x} + ex\left(a+b\sin^{-1}(cx)\right) + \frac{1}{2}(bcd)\text{Sub}$$

$$= \frac{be\sqrt{1-c^2x^2}}{c} - \frac{d(a+b\sin^{-1}(cx))}{x} + ex\left(a+b\sin^{-1}(cx)\right) - \frac{(bd)\text{Subst}}{}$$

$$= \frac{be\sqrt{1-c^2x^2}}{c} - \frac{d(a+b\sin^{-1}(cx))}{x} + ex\left(a+b\sin^{-1}(cx)\right) - bcd\tanh^{-1}$$

Mathematica [A]
time = 0.04, size = 71, normalized size = 1.08

$$-\frac{ad}{x} + aex + \frac{be\sqrt{1-c^2x^2}}{c} - \frac{bd\text{ArcSin}(cx)}{x} + bex\text{ArcSin}(cx) - bcd\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

[Out] -((a*d)/x) + a*e*x + (b*e*Sqrt[1 - c^2*x^2])/c - (b*d*ArcSin[c*x])/x + b*e*
x*ArcSin[c*x] - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]

Maple [A]
time = 0.01, size = 79, normalized size = 1.20

method	result	size
derivativedivides	$c\left(\frac{a\left(cex-\frac{dc}{x}\right)}{c^2}+\frac{b\left(\arcsin(cx)ecx-\frac{\arcsin(cx)dc}{x}+e\sqrt{-c^2x^2+1}-d\,c^2\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)}{c^2}\right)$	79
default	$c\left(\frac{a\left(cex-\frac{dc}{x}\right)}{c^2}+\frac{b\left(\arcsin(cx)ecx-\frac{\arcsin(cx)dc}{x}+e\sqrt{-c^2x^2+1}-d\,c^2\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)}{c^2}\right)$	79

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)

[Out] c*(a/c^2*(c*e*x-d*c/x)+b/c^2*(arcsin(c*x)*e*c*x-arcsin(c*x)*d*c/x+e*(-c^2*x
^2+1)^(1/2)-d*c^2*arctanh(1/(-c^2*x^2+1)^(1/2))))

Maxima [A]
time = 0.50, size = 81, normalized size = 1.23

$$-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd+axe+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)be}{c}-\frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")

[Out] -(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d + a*x*
e + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*e/c - a*d/x

Fricas [A]
time = 1.72, size = 106, normalized size = 1.61

$$-\frac{bc^2dx\log\left(\sqrt{-c^2x^2+1}+1\right)-bc^2dx\log\left(\sqrt{-c^2x^2+1}-1\right)-2\,acx^2e-2\sqrt{-c^2x^2+1}\,bxe+2\,acd-2\,(bcx^2e-bcd)\arcsin(cx)}{2\,cx}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")

[Out] -1/2*(b*c^2*d*x*log(sqrt(-c^2*x^2 + 1) + 1) - b*c^2*d*x*log(sqrt(-c^2*x^2 +
 1) - 1) - 2*a*c*x^2*e - 2*sqrt(-c^2*x^2 + 1)*b*x*e + 2*a*c*d - 2*(b*c*x^2*
e - b*c*d)*arcsin(c*x))/(c*x)

Sympy [A]
time = 2.44, size = 75, normalized size = 1.14

$$-\frac{ad}{x}+aex+bcd\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)-\frac{bd\operatorname{asin}(cx)}{x}+be\left(\begin{cases}0 & \text{for } c=0\\ x\operatorname{asin}(cx)+\frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d/x + a*e*x + b*c*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (
I*asin(1/(c*x)), True)) - b*d*asin(c*x)/x + b*e*Piecewise((0, Eq(c, 0)), (x
*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 1032 vs. 2(62) = 124.
time = 0.57, size = 1032, normalized size = 15.64

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^6*d*x^4*arcsin(c*x)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(
sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/2*a*c^6*d*x^4/((c^
4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c
^2*x^2 + 1) + 1)^4) + b*c^5*d*x^3*log(abs(c)*abs(x))/((c^4*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3
) - b*c^5*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - b*c^4
*d*x^2*arcsin(c*x)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - a*c^4*d*x^2/((c^4*x^3/(sqrt(-c
^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
1)^2) + b*c^3*d*x*log(abs(c)*abs(x))/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^3*d*x*log(
sqrt(-c^2*x^2 + 1) + 1)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^3*e*x^3/((c^4*x^3/(sqrt
(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
 + 1)^3) - 1/2*b*c^2*d*arcsin(c*x)/(c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^
2*x/(sqrt(-c^2*x^2 + 1) + 1)) + 2*b*c^2*e*x^2*arcsin(c*x)/((c^4*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
 1)^2) - 1/2*a*c^2*d/(c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2
*x^2 + 1) + 1)) + 2*a*c^2*e*x^2/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c*e*x/((c^4*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1))
```

Mupad [B]
time = 0.36, size = 70, normalized size = 1.06

$$\frac{b\,e\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c}-\frac{b\,d\,\mathrm{asin}(c\,x)}{x}-b\,c\,d\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^2}}\right)-\frac{a\,(d-e\,x^2)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x^2,x)
```

```
[Out] (b*e*((1 - c^2*x^2)^(1/2) + c*x*asin(c*x)))/c - (b*d*asin(c*x))/x - b*c*d*a
tanh(1/(1 - c^2*x^2)^(1/2)) - (a*(d - e*x^2))/x
```

3.603 $\int \frac{(d+ex^2)(a+b\textbf{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=119

$$-\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}ibe\text{ArcSin}(cx)^2-\frac{d(a+b\text{ArcSin}(cx))}{2x^2}+be\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-be\text{ArcSin}(cx$$

```
[Out] -1/2*I*b*e*arcsin(c*x)^2-1/2*d*(a+b*arcsin(c*x))/x^2+b*e*arcsin(c*x)*ln(1-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*e*arcsin(c*x)*ln(x)+e*(a+b*arcsin(c*x))*ln(x
)-1/2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d*(-c^2*x^2+1)^
(1/2)/x
```

Rubi [A]
time = 0.17, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.526$, Rules used = {14, 4815, 6874, 270, 2363, 4721, 3798, 2221, 2317, 2438}

$$-\frac{d(a+b\text{ArcSin}(cx))}{2x^2}+e\log(x)(a+b\text{ArcSin}(cx))-\frac{1}{2}ibe\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{2}ibe\text{ArcSin}(cx)^2+be\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-be\log(x)\text{ArcSin}(cx)-\frac{bcd\sqrt{1-c^2x^2}}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d*Sqrt[1 - c^2*x^2])/x - (I/2)*b*e*ArcSin[c*x]^2 - (d*(a + b*ArcS
in[c*x]))/(2*x^2) + b*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - b*e*Ar
cSin[c*x]*Log[x] + e*(a + b*ArcSin[c*x])*Log[x] - (I/2)*b*e*PolyLog[2, E^((
2*I)*ArcSin[c*x])]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{(d+ex^2)\,(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d(a+b\sin^{-1}(cx))}{2x^2} + e\big(a+b\sin^{-1}(cx)\big)\log(x) - (bc)\int \frac{-\frac{d}{2x^2}+e\log(}{\sqrt{1-c^2x^2}}$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{2x^2} + e\big(a+b\sin^{-1}(cx)\big)\log(x) - (bc)\int \Bigg(-\frac{d}{2x^2\sqrt{1-}}$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{2x^2} + e\big(a+b\sin^{-1}(cx)\big)\log(x) + \frac{1}{2}(bcd)\int \frac{1}{x^2\sqrt{1-c^2}}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{d(a+b\sin^{-1}(cx))}{2x^2} - be\sin^{-1}(cx)\log(x) + e\big(a+b\,\mathrm{s}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{d(a+b\sin^{-1}(cx))}{2x^2} - be\sin^{-1}(cx)\log(x) + e\big(a+b\,\mathrm{s}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} - be\sin^{-1}(cx)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} + be\sin^{-1}(cx)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} + be\sin^{-1}(cx)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\sin^{-1}(cx)^2 - \frac{d(a+b\sin^{-1}(cx))}{2x^2} + be\sin^{-1}(cx)$$

Mathematica [A]

time = 0.09, size = 104, normalized size = 0.87

$$-\frac{ad+bcdx\sqrt{1-c^2x^2}+ibex^2\mathrm{ArcSin}(cx)^2+b\mathrm{ArcSin}(cx)\left(d-2ex^2\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)\right)-2aex^2\log(x)+ibex^2\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(a*d + b*c*d*x*Sqrt[1 - c^2*x^2] + I*b*e*x^2*ArcSin[c*x]^2 + b*ArcSin[
c*x]*(d - 2*e*x^2*Log[1 - E^((2*I)*ArcSin[c*x])]) - 2*a*e*x^2*Log[x] + I*b*
e*x^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/x^2
```

Maple [A]

time = 0.82, size = 201, normalized size = 1.69

method	result
derivativedivides	$c^2\Bigg(-\frac{da}{2c^2x^2}+\frac{ae\ln(cx)}{c^2}-\frac{ibe\arcsin(cx)^2}{2c^2}+\frac{idb}{2}-\frac{db\sqrt{-c^2x^2+1}}{2cx}-\frac{db\arcsin(cx)}{2c^2x^2}+\frac{be\arcsin(cx)\ln\Big(}{}$

default	$c^2\left(-\frac{da}{2c^2x^2}+\frac{ae\ln(cx)}{c^2}-\frac{ibe\arcsin(cx)^2}{2c^2}+\frac{idb}{2}-\frac{db\sqrt{-c^2x^2+1}}{2cx}-\frac{db\arcsin(cx)}{2c^2x^2}+\frac{be\arcsin(cx)\ln\left(1-\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/2*d*a/c^2/x^2+a/c^2*e*ln(c*x)-1/2*I*b/c^2*e*arcsin(c*x)^2+1/2*I*d*b
-1/2*d*b/c/x*(-c^2*x^2+1)^(1/2)-1/2*d*b*arcsin(c*x)/c^2/x^2+b/c^2*e*arcsin(
c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+b/c^2*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^
2+1)^(1/2))-I*b/c^2*e*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-I*b/c^2*e*polylog
(2,-I*c*x-(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) + b*e*integrate(arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) + a*e*log(x) - 1/2*a*d/x^2
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*x^2*e + a*d + (b*x^2*e + b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(a+b\,\mathrm{asin}\,(cx))\,(d+ex^2)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)/x**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2))/x^3, x)
```

3.604 $\int \frac{(d+ex^2)(a+b\text{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=85

$$-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\text{ArcSin}(cx))}{3x^3}-\frac{e(a+b\text{ArcSin}(cx))}{x}-\frac{1}{6}bc(c^2d+6e)\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/3*d*(a+b*arcsin(c*x))/x^3-e*(a+b*arcsin(c*x))/x-1/6*b*c*(c^2*d+6*e)*arct
anh((-c^2*x^2+1)^(1/2))-1/6*b*c*d*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.06, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {14, 4815, 12, 457, 79, 65, 214}

$$-\frac{d(a+b\text{ArcSin}(cx))}{3x^3}-\frac{e(a+b\text{ArcSin}(cx))}{x}-\frac{1}{6}bc(c^2d+6e)\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d*Sqrt[1 - c^2*x^2])/x^2 - (d*(a + b*ArcSin[c*x]))/(3*x^3) - (e*(
a + b*ArcSin[c*x]))/x - (b*c*(c^2*d + 6*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
```

```
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\sin^{-1}(cx))}{x^4}\,dx = -\frac{d(a+b\sin^{-1}(cx))}{3x^3} - \frac{e(a+b\sin^{-1}(cx))}{x} - (bc)\int \frac{-d-3ex^2}{3x^3\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{3x^3} - \frac{e(a+b\sin^{-1}(cx))}{x} - \frac{1}{3}(bc)\int \frac{-d-3ex^2}{x^3\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d(a+b\sin^{-1}(cx))}{3x^3} - \frac{e(a+b\sin^{-1}(cx))}{x} - \frac{1}{6}(bc)\text{Subst}\left(\int \frac{-d-3ex}{x^2\sqrt{1-c^2x}}\right.$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2} - \frac{d(a+b\sin^{-1}(cx))}{3x^3} - \frac{e(a+b\sin^{-1}(cx))}{x} + \frac{1}{12}(bc(c^2$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2} - \frac{d(a+b\sin^{-1}(cx))}{3x^3} - \frac{e(a+b\sin^{-1}(cx))}{x} - \frac{(b(c^2d+}{}$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2} - \frac{d(a+b\sin^{-1}(cx))}{3x^3} - \frac{e(a+b\sin^{-1}(cx))}{x} - \frac{1}{6}bc(c^2d$$

Mathematica [A]
time = 0.04, size = 109, normalized size = 1.28

$$-\frac{ad}{3x^3}-\frac{ae}{x}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{bd\text{ArcSin}(cx)}{3x^3}-\frac{be\text{ArcSin}(cx)}{x}-\frac{1}{6}bc^3d\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-bce\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/3*(a*d)/x^3 - (a*e)/x - (b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (b*d*ArcSin[
c*x])/(3*x^3) - (b*e*ArcSin[c*x])/x - (b*c^3*d*ArcTanh[Sqrt[1 - c^2*x^2]])/
6 - b*c*e*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A]
time = 0.01, size = 120, normalized size = 1.41

method	result
derivativedivides	$c^3\left(\frac{a\left(-\frac{d}{3c\,x^3}-\frac{e}{cx}\right)}{c^2}+\frac{b\left(-\frac{\arcsin(cx)d}{3c\,x^3}-\frac{\arcsin(cx)e}{cx}+\frac{d\,c^2\left(-\frac{\sqrt{-c^2x^2+1}}{2c^2x^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{2}\right)}{3}-e\operatorname{arc}\right.}{c^2}\right.$

default		$c^3 \left(\frac{a\left(-\frac{d}{3c\,x^3}-\frac{e}{cx}\right)}{c^2} + \frac{b\left(-\frac{\arcsin(cx)d}{3c\,x^3}-\frac{\arcsin(cx)e}{cx}+\frac{d\,c^2\left(-\frac{\sqrt{-c^2x^2+1}}{2c^2x^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{2}\right)}{3}-e\,a\right.}{c^2}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(a/c^2*(-1/3*d/c/x^3-e/c/x)+b/c^2*(-1/3*arcsin(c*x)*d/c/x^3-arcsin(c*x)
*e/c/x+1/3*d*c^2*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*arctanh(1/(-c^2*x^2+1
)^(1/2)))-e*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.47, size = 121, normalized size = 1.42

$$-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)be-\frac{ae}{x}-\frac{ad}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)
/x^2)*c + 2*arcsin(c*x)/x^3)*b*d - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/a
bs(x)) + arcsin(c*x)/x)*b*e - a*e/x - 1/3*a*d/x^3
```

Fricas [A]
time = 1.20, size = 125, normalized size = 1.47

$$-\frac{2\sqrt{-c^2x^2+1}\,bcdx+12\,ax^2e+4\,ad+4\,(3\,bx^2e+bd)\arcsin(cx)+(bc^3dx^3+6\,bcx^3e)\log\left(\sqrt{-c^2x^2+1}+1\right)-(bc^3dx^3+6\,bcx^3e)\log\left(\sqrt{-c^2x^2+1}-1\right)}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/12*(2*sqrt(-c^2*x^2 + 1)*b*c*d*x + 12*a*x^2*e + 4*a*d + 4*(3*b*x^2*e + b
*d)*arcsin(c*x) + (b*c^3*d*x^3 + 6*b*c*x^3*e)*log(sqrt(-c^2*x^2 + 1) + 1) -
 (b*c^3*d*x^3 + 6*b*c*x^3*e)*log(sqrt(-c^2*x^2 + 1) - 1))/x^3
```

Sympy [A]
time = 3.21, size = 168, normalized size = 1.98

$$-\frac{ad}{3x^3}-\frac{ae}{x}+\frac{bcd\left(\begin{cases}-\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2}+\frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}}-\frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for } \frac{1}{|c^2x^2|}>1\\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2}-\frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise}\end{cases}\right)}{3}+bce\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)-\frac{bd\operatorname{asin}(cx)}{3x^3}-\frac{be\operatorname{asin}(cx)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d/(3*x**3) - a*e/x + b*c*d*Piecewise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sq
rt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2
*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), T
rue))/3 + b*c*e*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(
1/(c*x)), True)) - b*d*asin(c*x)/(3*x**3) - b*e*asin(c*x)/x
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 424 vs. 2(75) = 150.
time = 121.54, size = 424, normalized size = 4.99

$$-\frac{bc^6dx^3\arcsin(cx)}{24\left(\sqrt{-c^2x^2+1}+1\right)^3}-\frac{ac^6dx^3}{24\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{bc^5dx^2}{24\left(\sqrt{-c^2x^2+1}+1\right)^2}-\frac{bc^4dx\arcsin(cx)}{8\left(\sqrt{-c^2x^2+1}+1\right)}-\frac{ac^4dx}{8\left(\sqrt{-c^2x^2+1}+1\right)}+\frac{1}{6}bc^3d\log(|c||x|)-\frac{1}{6}bc^3d\log\left(\sqrt{-c^2x^2+1}+1\right)-\frac{bc^2ex\arcsin(cx)}{2\left(\sqrt{-c^2x^2+1}+1\right)}-\frac{bc^2d\left(\sqrt{-c^2x^2+1}+1\right)\arcsin(cx)}{8x}-\frac{ac^2ex}{2\left(\sqrt{-c^2x^2+1}+1\right)}-\frac{ac^2d\left(\sqrt{-c^2x^2+1}+1\right)}{8x}+bce\log(|c||x|)-bce\log\left(\sqrt{-c^2x^2+1}+1\right)-\frac{bcd\left(\sqrt{-c^2x^2+1}+1\right)^2}{24x^2}-\frac{be\left(\sqrt{-c^2x^2+1}+1\right)\arcsin(cx)}{2x}-\frac{bd\left(\sqrt{-c^2x^2+1}+1\right)^3\arcsin(cx)}{24x^3}-\frac{ae\left(\sqrt{-c^2x^2+1}+1\right)}{2x}-\frac{ad\left(\sqrt{-c^2x^2+1}+1\right)^3}{24x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^6*d*x^3*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1)^3 - 1/24*a*c^6*d*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + 1/24*b*c^5*d*x^2/(sqrt(-c^2*x^2 + 1) + 1)^2 -
 1/8*b*c^4*d*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) - 1/8*a*c^4*d*x/(sqrt(-
c^2*x^2 + 1) + 1) + 1/6*b*c^3*d*log(abs(c)*abs(x)) - 1/6*b*c^3*d*log(sqrt(-
c^2*x^2 + 1) + 1) - 1/2*b*c^2*e*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) - 1/
8*b*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x - 1/2*a*c^2*e*x/(sqrt(-c^2
*x^2 + 1) + 1) - 1/8*a*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)/x + b*c*e*log(abs(c)*
abs(x)) - b*c*e*log(sqrt(-c^2*x^2 + 1) + 1) - 1/24*b*c*d*(sqrt(-c^2*x^2 + 1
) + 1)^2/x^2 - 1/2*b*e*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x - 1/24*b*d*(s
qrt(-c^2*x^2 + 1) + 1)^3*arcsin(c*x)/x^3 - 1/2*a*e*(sqrt(-c^2*x^2 + 1) + 1)
/x - 1/24*a*d*(sqrt(-c^2*x^2 + 1) + 1)^3/x^3
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,\left(e\,x^2+d\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2))/x^4, x)
```

3.605 $\int x^4(d+ex^2)^2 (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=241

$$\frac{b(63c^4d^2+90c^2de+35e^2)\sqrt{1-c^2x^2}}{315c^9}-\frac{2b(63c^4d^2+135c^2de+70e^2)(1-c^2x^2)^{3/2}}{945c^9}+\frac{b(21c^4d^2+90c^2de+70}{525c^9}$$

```
[Out] -2/945*b*(63*c^4*d^2+135*c^2*d*e+70*e^2)*(-c^2*x^2+1)^(3/2)/c^9+1/525*b*(21
*c^4*d^2+90*c^2*d*e+70*e^2)*(-c^2*x^2+1)^(5/2)/c^9-2/441*b*e*(9*c^2*d+14*e)
*(-c^2*x^2+1)^(7/2)/c^9+1/81*b*e^2*(-c^2*x^2+1)^(9/2)/c^9+1/5*d^2*x^5*(a+b*
arcsin(c*x))+2/7*d*e*x^7*(a+b*arcsin(c*x))+1/9*e^2*x^9*(a+b*arcsin(c*x))+1/
315*b*(63*c^4*d^2+90*c^2*d*e+35*e^2)*(-c^2*x^2+1)^(1/2)/c^9
```

Rubi [A]
time = 0.23, antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {276, 4815, 12, 1265, 911, 1167}

$$\frac{1}{5}d^2x^5(a+b\text{ArcSin}(cx))+\frac{2}{7}dex^7(a+b\text{ArcSin}(cx))+\frac{1}{9}e^2x^9(a+b\text{ArcSin}(cx))-\frac{2be(1-c^2x^2)^{7/2}(9c^2d+14e)}{441c^9}+\frac{be^2(1-c^2x^2)^{9/2}}{81c^9}+\frac{b(1-c^2x^2)^{5/2}(21c^4d^2+90c^2de+70e^2)}{525c^9}-\frac{2b(1-c^2x^2)^{3/2}(63c^4d^2+135c^2de+70e^2)}{945c^9}+\frac{b\sqrt{1-c^2x^2}(63c^4d^2+90c^2de+35e^2)}{315c^9}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(63*c^4*d^2 + 90*c^2*d*e + 35*e^2)*Sqrt[1 - c^2*x^2])/(315*c^9) - (2*b*(
63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (b*(21*
c^4*d^2 + 90*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (2*b*e*(9*c
^2*d + 14*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^2*(1 - c^2*x^2)^(9/2))/(
81*c^9) + (d^2*x^5*(a + b*ArcSin[c*x]))/5 + (2*d*e*x^7*(a + b*ArcSin[c*x]))
/7 + (e^2*x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
```

```
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^4\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}\right.$$

$$=\frac{1}{5}d^2x^5\left(a+b\sin^{-1}(cx)\right)+\frac{2}{7}dex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{9}e^2x^9\left(a+b\sin^{-1}\right.$$

$$=\frac{b(63c^4d^2+90c^2de+35e^2)\sqrt{1-c^2x^2}}{315c^9}-\frac{2b(63c^4d^2+135c^2de+70e^2}{945c^9}$$

Mathematica [A]

time = 0.14, size = 187, normalized size = 0.78

$$\frac{315ax^5(63d^2+90dex^2+35e^2x^4)+\frac{b\sqrt{1-c^2x^2}\,(4480e^2+160c^2e(81d+14ex^2)+24c^4(441d^2+270dex^2+70e^2x^4)+4c^6(1323d^2x^2+1215dex^4+350e^2x^6)+c^8(3969d^2x^4+4050dex^6+1225e^2x^8))}{c^9}+315bx^5(63d^2+90dex^2+35e^2x^4)\operatorname{ArcSin}(cx)}{99225}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x^5*(63*d^2 + 90*d*e*x^2 + 35*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(4480*
e^2 + 160*c^2*e*(81*d + 14*e*x^2) + 24*c^4*(441*d^2 + 270*d*e*x^2 + 70*e^2*
x^4) + 4*c^6*(1323*d^2*x^2 + 1215*d*e*x^4 + 350*e^2*x^6) + c^8*(3969*d^2*x^
4 + 4050*d*e*x^6 + 1225*e^2*x^8)))/c^9 + 315*b*x^5*(63*d^2 + 90*d*e*x^2 + 3
5*e^2*x^4)*ArcSin[c*x])/99225
```

Maple [A]

time = 0.14, size = 339, normalized size = 1.41

method	result
derivativedivides	$\frac{a\left(\frac{1}{5}d^2c^9x^5+\frac{2}{7}dc^9ex^7+\frac{1}{9}e^2c^9x^9\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)d^2c^9x^5}{5}+\frac{2\arcsin(cx)dc^9ex^7}{7}+\frac{\arcsin(cx)e^2c^9x^9}{9}-\frac{d^2c^4\left(-\frac{c^4x^4\sqrt{-c^2x^2+}}{5}\right.}{}\right.}{}$
default	$\frac{a\left(\frac{1}{5}d^2c^9x^5+\frac{2}{7}dc^9ex^7+\frac{1}{9}e^2c^9x^9\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)d^2c^9x^5}{5}+\frac{2\arcsin(cx)dc^9ex^7}{7}+\frac{\arcsin(cx)e^2c^9x^9}{9}-\frac{d^2c^4\left(-\frac{c^4x^4\sqrt{-c^2x^2+}}{5}\right.}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(a/c^4*(1/5*d^2*c^9*x^5+2/7*d*c^9*e*x^7+1/9*e^2*c^9*x^9)+b/c^4*(1/5*a
rcsin(c*x)*d^2*c^9*x^5+2/7*arcsin(c*x)*d*c^9*e*x^7+1/9*arcsin(c*x)*e^2*c^9*
x^9-1/5*d^2*c^4*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^
(1/2)-8/15*(-c^2*x^2+1)^(1/2))-2/7*d*c^2*e*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)
-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^
2*x^2+1)^(1/2))-1/9*e^2*(-1/9*c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2
*x^2+1)^(1/2)-16/105*c^4*x^4*(-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)
^(1/2)-128/315*(-c^2*x^2+1)^(1/2))))
```

Maxima [A]

time = 0.49, size = 314, normalized size = 1.30

$$\frac{1}{9}ax^9e^2+\frac{2}{7}adx^7e+\frac{1}{5}ad^2x^5+\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2+\frac{2}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bde+\frac{1}{2835}\left(315x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}\,x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}\,x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}\,x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}\,x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right)be^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*x^9*e^2 + 2/7*a*d*x^7*e + 1/5*a*d^2*x^5 + 1/75*(15*x^5*arcsin(c*x) +
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c)*b*d^2 + 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*
x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*
sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d*e + 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-
c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1
)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)
*b*e^2
```

Fricas [A]
time = 1.50, size = 216, normalized size = 0.90

$$\frac{11025\,ac^9x^9e^2 + 28350\,ac^9dx^7e + 19845\,ac^9d^2x^5 + 315\,(35\,bc^9x^9e^2 + 90\,bc^9dx^7e + 63\,bc^9d^2x^5)\arcsin(cx) + (3969\,bc^8d^2x^4 + 5292\,bc^6d^2x^2 + 10584\,bc^4d^2 + 35\,(35\,bc^8x^8 + 40\,bc^6x^6 + 48\,bc^4x^4 + 64\,bc^2x^2 + 128\,b)e^2 + 810\,(5\,bc^8dx^6 + 6\,bc^6dx^4 + 8\,bc^4dx^2 + 16\,bc^2d)e)\sqrt{-c^2x^2+1}}{99225\,c^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*x^9*e^2 + 28350*a*c^9*d*x^7*e + 19845*a*c^9*d^2*x^5 +
315*(35*b*c^9*x^9*e^2 + 90*b*c^9*d*x^7*e + 63*b*c^9*d^2*x^5)*arcsin(c*x) +
(3969*b*c^8*d^2*x^4 + 5292*b*c^6*d^2*x^2 + 10584*b*c^4*d^2 + 35*(35*b*c^8*x
^8 + 40*b*c^6*x^6 + 48*b*c^4*x^4 + 64*b*c^2*x^2 + 128*b)*e^2 + 810*(5*b*c^8
*d*x^6 + 6*b*c^6*d*x^4 + 8*b*c^4*d*x^2 + 16*b*c^2*d)*e)*sqrt(-c^2*x^2 + 1))
/c^9
```

Sympy [A]
time = 1.74, size = 415, normalized size = 1.72

$$\begin{cases} \frac{ad^2x^5}{5} + \frac{2adex^7}{7} + \frac{ae^2x^9}{9} + \frac{bd^2x^5\operatorname{asin}(cx)}{5} + \frac{2bdex^7\operatorname{asin}(cx)}{7} + \frac{be^2x^9\operatorname{asin}(cx)}{9} + \frac{bd^2x^4\sqrt{-c^2x^2+1}}{25c} + \frac{2bdex^6\sqrt{-c^2x^2+1}}{49c} + \frac{be^2x^8\sqrt{-c^2x^2+1}}{81c} + \frac{4bd^2x^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{12bdex^4\sqrt{-c^2x^2+1}}{245c^3} + \frac{8be^2x^6\sqrt{-c^2x^2+1}}{567c^3} + \frac{8bd^2\sqrt{-c^2x^2+1}}{75c^5} + \frac{16bdex^2\sqrt{-c^2x^2+1}}{245c^5} + \frac{16be^2x^4\sqrt{-c^2x^2+1}}{945c^5} + \frac{32bde\sqrt{-c^2x^2+1}}{245c^7} + \frac{64be^2x^2\sqrt{-c^2x^2+1}}{2835c^7} + \frac{128be^2\sqrt{-c^2x^2+1}}{2835c^9} & \text{for}\: c \neq 0 \\ a\left(\frac{d^2x^5}{5} + \frac{2dex^7}{7} + \frac{e^2x^9}{9}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**5/5 + 2*a*d*e*x**7/7 + a*e**2*x**9/9 + b*d**2*x**5*asi
n(c*x)/5 + 2*b*d*e*x**7*asin(c*x)/7 + b*e**2*x**9*asin(c*x)/9 + b*d**2*x**4
*sqrt(-c**2*x**2 + 1)/(25*c) + 2*b*d*e*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b
*e**2*x**8*sqrt(-c**2*x**2 + 1)/(81*c) + 4*b*d**2*x**2*sqrt(-c**2*x**2 + 1)
/(75*c**3) + 12*b*d*e*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) + 8*b*e**2*x**6*
sqrt(-c**2*x**2 + 1)/(567*c**3) + 8*b*d**2*sqrt(-c**2*x**2 + 1)/(75*c**5) +
 16*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**2*x**4*sqrt(-c**2*
x**2 + 1)/(945*c**5) + 32*b*d*e*sqrt(-c**2*x**2 + 1)/(245*c**7) + 64*b*e**2
*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e**2*sqrt(-c**2*x**2 + 1)/(2
835*c**9), Ne(c, 0)), (a*(d**2*x**5/5 + 2*d*e*x**7/7 + e**2*x**9/9), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 598 vs. 2(215) = 430.

time = 0.42, size = 598, normalized size = 2.48

$$\frac{1}{9}ae^2x^9+\frac{2}{7}adex^7+\frac{1}{5}ad^2x^5+\frac{(c^2x^2-1)^2bd^2x\arcsin(cx)}{5c^4}+\frac{2(c^2x^2-1)bd^2x\arcsin(cx)}{5c^4}+\frac{2(c^2x^2-1)^3bdex\arcsin(cx)}{7c^6}+\frac{bd^2x\arcsin(cx)}{5c^4}+\frac{6(c^2x^2-1)^2bdex\arcsin(cx)}{7c^6}+\frac{(c^2x^2-1)^4be^2x\arcsin(cx)}{9c^8}+\frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^2}{25c^5}+\frac{6(c^2x^2-1)bdex\arcsin(cx)}{7c^6}+\frac{4(c^2x^2-1)^3be^2x\arcsin(cx)}{9c^8}-\frac{2(-c^2x^2+1)^{\frac{3}{2}}bd^2}{15c^5}+\frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bde}{49c^7}+\frac{2bdex\arcsin(cx)}{7c^6}+\frac{2(c^2x^2-1)^2be^2x\arcsin(cx)}{3c^8}+\frac{\sqrt{-c^2x^2+1}\,bd^2}{5c^5}+\frac{6(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bde}{35c^7}+\frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}\,be^2}{81c^9}+\frac{4(c^2x^2-1)be^2x\arcsin(cx)}{9c^8}-\frac{2(-c^2x^2+1)^{\frac{3}{2}}bde}{7c^7}+\frac{4(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,be^2}{63c^9}+\frac{be^2x\arcsin(cx)}{9c^8}+\frac{2\sqrt{-c^2x^2+1}\,bde}{7c^7}+\frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^2}{15c^9}-\frac{4(-c^2x^2+1)^{\frac{3}{2}}be^2}{27c^9}+\frac{\sqrt{-c^2x^2+1}\,be^2}{9c^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*e^2*x^9 + 2/7*a*d*e*x^7 + 1/5*a*d^2*x^5 + 1/5*(c^2*x^2 - 1)^2*b*d^2*x
*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^4 + 2/7*(c^2*x^2
 - 1)^3*b*d*e*x*arcsin(c*x)/c^6 + 1/5*b*d^2*x*arcsin(c*x)/c^4 + 6/7*(c^2*x^
2 - 1)^2*b*d*e*x*arcsin(c*x)/c^6 + 1/9*(c^2*x^2 - 1)^4*b*e^2*x*arcsin(c*x)/
c^8 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 6/7*(c^2*x^2 - 1)
*b*d*e*x*arcsin(c*x)/c^6 + 4/9*(c^2*x^2 - 1)^3*b*e^2*x*arcsin(c*x)/c^8 - 2/
15*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^5 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)
*b*d*e/c^7 + 2/7*b*d*e*x*arcsin(c*x)/c^6 + 2/3*(c^2*x^2 - 1)^2*b*e^2*x*arcs
in(c*x)/c^8 + 1/5*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 6/35*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*b*d*e/c^7 + 1/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^2/c^9
 + 4/9*(c^2*x^2 - 1)*b*e^2*x*arcsin(c*x)/c^8 - 2/7*(-c^2*x^2 + 1)^(3/2)*b*d
*e/c^7 + 4/63*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^2/c^9 + 1/9*b*e^2*x*ar
csin(c*x)/c^8 + 2/7*sqrt(-c^2*x^2 + 1)*b*d*e/c^7 + 2/15*(c^2*x^2 - 1)^2*sqr
t(-c^2*x^2 + 1)*b*e^2/c^9 - 4/27*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^9 + 1/9*sqrt(
-c^2*x^2 + 1)*b*e^2/c^9
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^2,x)
```

```
[Out] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.606 $\int x^3(d+ex^2)^2 (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=241

$$\frac{b(288c^4d^2+320c^2de+105e^2)\,x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b(288c^4d^2+320c^2de+105e^2)\,x^3\sqrt{1-c^2x^2}}{4608c^5}+\frac{be(64c^2d+21e)\,x}{1152c}$$

```
[Out] -1/3072*b*(288*c^4*d^2+320*c^2*d*e+105*e^2)*arcsin(c*x)/c^8+1/4*d^2*x^4*(a+
b*arcsin(c*x))+1/3*d*e*x^6*(a+b*arcsin(c*x))+1/8*e^2*x^8*(a+b*arcsin(c*x))+
1/3072*b*(288*c^4*d^2+320*c^2*d*e+105*e^2)*x*(-c^2*x^2+1)^(1/2)/c^7+1/4608*
b*(288*c^4*d^2+320*c^2*d*e+105*e^2)*x^3*(-c^2*x^2+1)^(1/2)/c^5+1/1152*b*e*(
64*c^2*d+21*e)*x^5*(-c^2*x^2+1)^(1/2)/c^3+1/64*b*e^2*x^7*(-c^2*x^2+1)^(1/2)
/c
```

Rubi [A]
time = 0.18, antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$, Rules used = {272, 45, 4815, 12, 1281, 470, 327, 222}

$$\frac{1}{4}d^2x^4(a+b\text{ArcSin}(cx))+\frac{1}{3}dex^6(a+b\text{ArcSin}(cx))+\frac{1}{8}e^2x^8(a+b\text{ArcSin}(cx))-\frac{b\text{ArcSin}(cx)\,(288c^4d^2+320c^2de+105e^2)}{3072c^8}+\frac{be^2x^7\sqrt{1-c^2x^2}}{64c}+\frac{bex^5\sqrt{1-c^2x^2}\,(64c^2d+21e)}{1152c^3}+\frac{bx\sqrt{1-c^2x^2}\,(288c^4d^2+320c^2de+105e^2)}{3072c^7}+\frac{bx^3\sqrt{1-c^2x^2}\,(288c^4d^2+320c^2de+105e^2)}{4608c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x*Sqrt[1 - c^2*x^2])/(3072*c^7) +
(b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x^3*Sqrt[1 - c^2*x^2])/(4608*c^5)
+ (b*e*(64*c^2*d + 21*e)*x^5*Sqrt[1 - c^2*x^2])/(1152*c^3) + (b*e^2*x^7*Sqr
t[1 - c^2*x^2])/(64*c) - (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*ArcSin[c*
x])/(3072*c^8) + (d^2*x^4*(a + b*ArcSin[c*x]))/4 + (d*e*x^6*(a + b*ArcSin[c
*x]))/3 + (e^2*x^8*(a + b*ArcSin[c*x]))/8
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^3\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\sin^{-}\right.$$

$$=\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\sin^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\sin^{-}\right.$$

$$=\frac{be^2x^7\sqrt{1-c^2x^2}}{64c}+\frac{1}{4}d^2x^4\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\sin^{-1}(cx)\right)$$

$$=\frac{be\left(64c^2d+21e\right)x^5\sqrt{1-c^2x^2}}{1152c^3}+\frac{be^2x^7\sqrt{1-c^2x^2}}{64c}+\frac{1}{4}d^2x^4\left(a+b\sin\right.$$

$$=\frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x^3\sqrt{1-c^2x^2}}{4608c^5}+\frac{be\left(64c^2d+21e\right)x^5\sqrt{1}}{1152c^3}$$

$$=\frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b\left(288c^4d^2+5e\left(64c^2d+\right.\right.}{4608}$$

$$=\frac{b\left(288c^4d^2+5e\left(64c^2d+21e\right)\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b\left(288c^4d^2+5e\left(64c^2d+\right.\right.}{4608}$$

Mathematica [A]
time = 0.11, size = 190, normalized size = 0.79

$$\frac{384ac^8x^4\left(6d^2+8dex^2+3e^2x^4\right)+bcx\sqrt{1-c^2x^2}\left(315e^2+30c^2e\left(32d+7ex^2\right)+8c^4\left(108d^2+80dex^2+21e^2x^4\right)+16c^6\left(36d^2x^2+32dex^4+9e^2x^6\right)\right)+3b\left(-288c^4d^2-320c^2de-105e^2+128c^8\left(6d^2x^4+8dex^6+3e^2x^8\right)\right)\mathrm{ArcSin}(cx)}{9216c^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (384*a*c^8*x^4*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4) + b*c*x*Sqrt[1 - c^2*x^2]*(3
15*e^2 + 30*c^2*e*(32*d + 7*e*x^2) + 8*c^4*(108*d^2 + 80*d*e*x^2 + 21*e^2*x
^4) + 16*c^6*(36*d^2*x^2 + 32*d*e*x^4 + 9*e^2*x^6)) + 3*b*(-288*c^4*d^2 - 3
20*c^2*d*e - 105*e^2 + 128*c^8*(6*d^2*x^4 + 8*d*e*x^6 + 3*e^2*x^8))*ArcSin[
c*x])/(9216*c^8)
```

Maple [A]
time = 0.13, size = 303, normalized size = 1.26

method	result
derivativedivides	$\frac{\frac{a\left(\frac{1}{4}d^2c^8x^4+\frac{1}{3}d\,c^8e\,x^6+\frac{1}{8}e^2c^8x^8\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)d^2c^8x^4}{4}+\frac{\arcsin(cx)d\,c^8e\,x^6}{3}+\frac{\arcsin(cx)e^2c^8x^8}{8}-\frac{d^2c^4\left(-\frac{c^3x^3\sqrt{-c^2x^2+1}}{4}\right.}{}\right.}{}}{}$

default	$\frac{a\left(\frac{1}{4}d^{2}c^{8}x^{4}+\frac{1}{3}d\,c^{8}e\,x^{6}+\frac{1}{8}e^{2}c^{8}x^{8}\right)}{c^{4}}+\frac{b\left(\frac{\arcsin(cx)d^{2}c^{8}x^{4}}{4}+\frac{\arcsin(cx)d\,c^{8}e\,x^{6}}{3}+\frac{\arcsin(cx)e^{2}c^{8}x^{8}}{8}-\frac{d^{2}c^{4}\left(-\frac{c^{3}x^{3}\sqrt{-c^{2}x^{2}+}}{4}\right.}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/c^4*(a/c^4*(1/4*d^2*c^8*x^4+1/3*d*c^8*e*x^6+1/8*e^2*c^8*x^8)+b/c^4*(1/4*arcsin(c*x)*d^2*c^8*x^4+1/3*arcsin(c*x)*d*c^8*e*x^6+1/8*arcsin(c*x)*e^2*c^8*x^8-1/4*d^2*c^4*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-1/3*d*c^2*e*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-1/8*e^2*(-1/8*c^7*x^7*(-c^2*x^2+1)^(1/2)-7/48*c^5*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^3*(-c^2*x^2+1)^(1/2)-35/128*c*x*(-c^2*x^2+1)^(1/2)+35/128*arcsin(c*x))))

Maxima [A]
time = 0.47, size = 284, normalized size = 1.18

$$\frac{1}{8}ax^{8}e^{2}+\frac{1}{3}adx^{6}e+\frac{1}{4}ad^{2}x^{4}+\frac{1}{32}\left(8x^{4}\arcsin(cx)+\left(\frac{2\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{2}}+\frac{3\sqrt{-c^{2}x^{2}+1}\,x}{c^{4}}-\frac{3\arcsin(cx)}{c^{5}}\right)c\right)bd^{2}+\frac{1}{144}\left(48x^{6}\arcsin(cx)+\left(\frac{8\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{2}}+\frac{10\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{4}}+\frac{15\sqrt{-c^{2}x^{2}+1}\,x}{c^{6}}-\frac{15\arcsin(cx)}{c^{7}}\right)c\right)bde+\frac{1}{3072}\left(384x^{8}\arcsin(cx)+\left(\frac{48\sqrt{-c^{2}x^{2}+1}\,x^{7}}{c^{2}}+\frac{56\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{4}}+\frac{70\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{6}}+\frac{105\sqrt{-c^{2}x^{2}+1}\,x}{c^{8}}-\frac{105\arcsin(cx)}{c^{9}}\right)c\right)be^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] 1/8*a*x^8*e^2 + 1/3*a*d*x^6*e + 1/4*a*d^2*x^4 + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^2 + 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*d*e + 1/3072*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*e^2

Fricas [A]
time = 1.21, size = 214, normalized size = 0.89

$$\frac{1152\,ac^{8}x^{8}e^{2}+3072\,ac^{8}dx^{6}e+2304\,ac^{8}d^{2}x^{4}+3\,(768\,bc^{8}d^{2}x^{4}-288\,bc^{4}d^{2}+3\,(128\,bc^{8}x^{8}-35\,b)e^{2}+64\,(16\,bc^{8}dx^{6}-5\,bc^{2}d)e)\arcsin(cx)+(576\,bc^{7}d^{2}x^{3}+864\,bc^{5}d^{2}x+3\,(48\,bc^{7}x^{7}+56\,bc^{5}x^{5}+70\,bc^{3}x^{3}+105\,bcx)e^{2}+64\,(8\,bc^{7}dx^{5}+10\,bc^{5}dx^{3}+15\,bc^{3}dx)e)\sqrt{-c^{2}x^{2}+1}}{9216\,c^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] 1/9216*(1152*a*c^8*x^8*e^2 + 3072*a*c^8*d*x^6*e + 2304*a*c^8*d^2*x^4 + 3*(768*b*c^8*d^2*x^4 - 288*b*c^4*d^2 + 3*(128*b*c^8*x^8 - 35*b)*e^2 + 64*(16*b*c^8*d*x^6 - 5*b*c^2*d)*e)*arcsin(c*x) + (576*b*c^7*d^2*x^3 + 864*b*c^5*d^2*x + 3*(48*b*c^7*x^7 + 56*b*c^5*x^5 + 70*b*c^3*x^3 + 105*b*c*x)*e^2 + 64*(8*b*c^7*d*x^5 + 10*b*c^5*d*x^3 + 15*b*c^3*d*x)*e)*sqrt(-c^2*x^2 + 1))/c^8

Sympy [A]
time = 1.13, size = 382, normalized size = 1.59

$$\begin{cases} \frac{ad^2x^4}{4} + \frac{adex^6}{3} + \frac{ae^2x^8}{8} + \frac{bd^2x^4\operatorname{asin}(cx)}{4} + \frac{bdex^6\operatorname{asin}(cx)}{3} + \frac{be^2x^8\operatorname{asin}(cx)}{8} + \frac{bd^2x^3\sqrt{-c^2x^2+1}}{16c} + \frac{bdex^5\sqrt{-c^2x^2+1}}{18c} + \frac{be^2x^7\sqrt{-c^2x^2+1}}{64c} + \frac{3bd^2x\sqrt{-c^2x^2+1}}{32c^3} + \frac{5bdex^3\sqrt{-c^2x^2+1}}{72c^3} + \frac{7be^2x^5\sqrt{-c^2x^2+1}}{384c^3} - \frac{3bd^2\operatorname{asin}(cx)}{32c^4} + \frac{5bdex\sqrt{-c^2x^2+1}}{48c^5} + \frac{35be^2x^3\sqrt{-c^2x^2+1}}{1536c^5} - \frac{5bde\operatorname{asin}(cx)}{48c^6} + \frac{35be^2x\sqrt{-c^2x^2+1}}{1024c^7} - \frac{35be^2\operatorname{asin}(cx)}{1024c^8} & \text{for}\ c \neq 0 \\ a\left(\frac{d^2x^4}{4} + \frac{dex^6}{3} + \frac{e^2x^8}{8}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**4/4 + a*d*e*x**6/3 + a*e**2*x**8/8 + b*d**2*x**4*asin(
c*x)/4 + b*d*e*x**6*asin(c*x)/3 + b*e**2*x**8*asin(c*x)/8 + b*d**2*x**3*sqr
t(-c**2*x**2 + 1)/(16*c) + b*d*e*x**5*sqrt(-c**2*x**2 + 1)/(18*c) + b*e**2*
x**7*sqrt(-c**2*x**2 + 1)/(64*c) + 3*b*d**2*x*sqrt(-c**2*x**2 + 1)/(32*c**3
) + 5*b*d*e*x**3*sqrt(-c**2*x**2 + 1)/(72*c**3) + 7*b*e**2*x**5*sqrt(-c**2*
x**2 + 1)/(384*c**3) - 3*b*d**2*asin(c*x)/(32*c**4) + 5*b*d*e*x*sqrt(-c**2*
x**2 + 1)/(48*c**5) + 35*b*e**2*x**3*sqrt(-c**2*x**2 + 1)/(1536*c**5) - 5*b
*d*e*asin(c*x)/(48*c**6) + 35*b*e**2*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) - 3
5*b*e**2*asin(c*x)/(1024*c**8), Ne(c, 0)), (a*(d**2*x**4/4 + d*e*x**6/3 + e
**2*x**8/8), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 498 vs. 2(217) = 434.
time = 0.44, size = 498, normalized size = 2.07

$$\frac{1}{8}ae^2x^8 + \frac{1}{3}adex^6 + \frac{1}{4}ad^2x^4 - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2x}{16c^3} + \frac{(c^2x^2-1)^2bd^2\arcsin(cx)}{4c^4} + \frac{5\sqrt{-c^2x^2+1}\,bd^2x}{32c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bdex}{18c^5} + \frac{(c^2x^2-1)bd^2\arcsin(cx)}{2c^4} + \frac{(c^2x^2-1)^3bde\arcsin(cx)}{3c^6} - \frac{13(-c^2x^2+1)^{\frac{3}{2}}bdex}{72c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,be^2x}{64c^7} + \frac{5bd^2\arcsin(cx)}{32c^4} + \frac{(c^2x^2-1)^2bde\arcsin(cx)}{c^6} + \frac{(c^2x^2-1)^4be^2\arcsin(cx)}{8c^8} + \frac{11\sqrt{-c^2x^2+1}\,bdex}{48c^5} + \frac{25(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^2x}{384c^7} + \frac{(c^2x^2-1)bde\arcsin(cx)}{c^6} + \frac{(c^2x^2-1)^3be^2\arcsin(cx)}{2c^8} - \frac{163(-c^2x^2+1)^{\frac{3}{2}}be^2x}{1536c^7} + \frac{11bde\arcsin(cx)}{48c^6} + \frac{3(c^2x^2-1)^2be^2\arcsin(cx)}{4c^8} + \frac{93\sqrt{-c^2x^2+1}\,be^2x}{1024c^7} + \frac{(c^2x^2-1)be^2\arcsin(cx)}{2c^8} + \frac{93be^2\arcsin(cx)}{1024c^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/8*a*e^2*x^8 + 1/3*a*d*e*x^6 + 1/4*a*d^2*x^4 - 1/16*(-c^2*x^2 + 1)^(3/2)*b
*d^2*x/c^3 + 1/4*(c^2*x^2 - 1)^2*b*d^2*arcsin(c*x)/c^4 + 5/32*sqrt(-c^2*x^2
 + 1)*b*d^2*x/c^3 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e*x/c^5 + 1
/2*(c^2*x^2 - 1)*b*d^2*arcsin(c*x)/c^4 + 1/3*(c^2*x^2 - 1)^3*b*d*e*arcsin(c
*x)/c^6 - 13/72*(-c^2*x^2 + 1)^(3/2)*b*d*e*x/c^5 + 1/64*(c^2*x^2 - 1)^3*sqr
t(-c^2*x^2 + 1)*b*e^2*x/c^7 + 5/32*b*d^2*arcsin(c*x)/c^4 + (c^2*x^2 - 1)^2*
b*d*e*arcsin(c*x)/c^6 + 1/8*(c^2*x^2 - 1)^4*b*e^2*arcsin(c*x)/c^8 + 11/48*s
qrt(-c^2*x^2 + 1)*b*d*e*x/c^5 + 25/384*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b
*e^2*x/c^7 + (c^2*x^2 - 1)*b*d*e*arcsin(c*x)/c^6 + 1/2*(c^2*x^2 - 1)^3*b*e^
2*arcsin(c*x)/c^8 - 163/1536*(-c^2*x^2 + 1)^(3/2)*b*e^2*x/c^7 + 11/48*b*d*e
*arcsin(c*x)/c^6 + 3/4*(c^2*x^2 - 1)^2*b*e^2*arcsin(c*x)/c^8 + 93/1024*sqrt
(-c^2*x^2 + 1)*b*e^2*x/c^7 + 1/2*(c^2*x^2 - 1)*b*e^2*arcsin(c*x)/c^8 + 93/1
024*b*e^2*arcsin(c*x)/c^8
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,(a+b\operatorname{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^2,x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.607 $\int x^2(d+ex^2)^2\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=198

$$\frac{b(35c^4d^2+42c^2de+15e^2)\sqrt{1-c^2x^2}}{105c^7}-\frac{b(35c^4d^2+84c^2de+45e^2)\,(1-c^2x^2)^{3/2}}{315c^7}+\frac{be(14c^2d+15e)\,(1-c^2x^2)}{175c^7}$$

```
[Out] -1/315*b*(35*c^4*d^2+84*c^2*d*e+45*e^2)*(-c^2*x^2+1)^(3/2)/c^7+1/175*b*e*(1
4*c^2*d+15*e)*(-c^2*x^2+1)^(5/2)/c^7-1/49*b*e^2*(-c^2*x^2+1)^(7/2)/c^7+1/3*
d^2*x^3*(a+b*arcsin(c*x))+2/5*d*e*x^5*(a+b*arcsin(c*x))+1/7*e^2*x^7*(a+b*ar
csin(c*x))+1/105*b*(35*c^4*d^2+42*c^2*d*e+15*e^2)*(-c^2*x^2+1)^(1/2)/c^7
```

Rubi [A]
time = 0.16, antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}=0.238$, Rules used = {276, 4815, 12, 1265, 785}

$$\frac{1}{3}d^2x^3(a+b\text{ArcSin}(cx))+\frac{2}{5}dex^5(a+b\text{ArcSin}(cx))+\frac{1}{7}e^2x^7(a+b\text{ArcSin}(cx))+\frac{be(1-c^2x^2)^{5/2}(14c^2d+15e)}{175c^7}-\frac{be^2(1-c^2x^2)^{7/2}}{49c^7}-\frac{b(1-c^2x^2)^{3/2}(35c^4d^2+84c^2de+45e^2)}{315c^7}+\frac{b\sqrt{1-c^2x^2}\,(35c^4d^2+42c^2de+15e^2)}{105c^7}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*Sqrt[1 - c^2*x^2])/(105*c^7) - (b*(35
*c^4*d^2 + 84*c^2*d*e + 45*e^2)*(1 - c^2*x^2)^(3/2))/(315*c^7) + (b*e*(14*c
^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^2*(1 - c^2*x^2)^(7/2))/(
49*c^7) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 + (2*d*e*x^5*(a + b*ArcSin[c*x]))
/5 + (e^2*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 785

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (
c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && NeQ[b^
2 - 4*a*c, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0] && IntegerQ[m]))
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^2\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\sin^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\sin^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\sin\right.$$

$$=\frac{b(35c^4d^2+42c^2de+15e^2)\sqrt{1-c^2x^2}}{105c^7}-\frac{b(35c^4d^2+84c^2de+45e^2)}{315c^7}$$

Mathematica [A]
time = 0.12, size = 158, normalized size = 0.80

$$\frac{105ax^3(35d^2+42dex^2+15e^2x^4)+\frac{b\sqrt{1-c^2x^2}\,(720e^2+24c^2e(98d+15ex^2)+2c^4(1225d^2+588dex^2+135e^2x^4)+c^6(1225d^2x^2+882dex^4+225e^2x^6))}{c^7}+105bx^3(35d^2+42dex^2+15e^2x^4)\,\mathrm{ArcSin}(cx)}{11025}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (105*a*x^3*(35*d^2 + 42*d*e*x^2 + 15*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(720*e
^2 + 24*c^2*e*(98*d + 15*e*x^2) + 2*c^4*(1225*d^2 + 588*d*e*x^2 + 135*e^2*x
^4) + c^6*(1225*d^2*x^2 + 882*d*e*x^4 + 225*e^2*x^6)))/c^7 + 105*b*x^3*(35*
d^2 + 42*d*e*x^2 + 15*e^2*x^4)*ArcSin[c*x])/11025
```

Maple [A]
time = 0.14, size = 279, normalized size = 1.41

method	result
derivativedivides	$\frac{a\left(\frac{1}{3}d^{2}c^{7}x^{3}+\frac{2}{5}d\,c^{7}e\,x^{5}+\frac{1}{7}e^{2}c^{7}x^{7}\right)}{c^{4}}+\frac{b\left(\frac{\arcsin(cx)d^{2}c^{7}x^{3}}{3}+\frac{2\arcsin(cx)d\,c^{7}e\,x^{5}}{5}+\frac{\arcsin(cx)e^{2}c^{7}x^{7}}{7}-\frac{d^{2}c^{4}\left(-\frac{c^{2}x^{2}\sqrt{-c^{2}x^{2}+}}{3}\right.}{3}\right.}{}$
default	$\frac{a\left(\frac{1}{3}d^{2}c^{7}x^{3}+\frac{2}{5}d\,c^{7}e\,x^{5}+\frac{1}{7}e^{2}c^{7}x^{7}\right)}{c^{4}}+\frac{b\left(\frac{\arcsin(cx)d^{2}c^{7}x^{3}}{3}+\frac{2\arcsin(cx)d\,c^{7}e\,x^{5}}{5}+\frac{\arcsin(cx)e^{2}c^{7}x^{7}}{7}-\frac{d^{2}c^{4}\left(-\frac{c^{2}x^{2}\sqrt{-c^{2}x^{2}+}}{3}\right.}{3}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(a/c^4*(1/3*d^2*c^7*x^3+2/5*d*c^7*e*x^5+1/7*e^2*c^7*x^7)+b/c^4*(1/3*a
rcsin(c*x)*d^2*c^7*x^3+2/5*arcsin(c*x)*d*c^7*e*x^5+1/7*arcsin(c*x)*e^2*c^7*
x^7-1/3*d^2*c^4*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-2/
5*d*c^2*e*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-
8/15*(-c^2*x^2+1)^(1/2))-1/7*e^2*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*
x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(
1/2))))
```

Maxima [A]
time = 0.50, size = 253, normalized size = 1.28

$$\frac{1}{7}\,ax^{7}e^{2}+\frac{2}{5}\,adx^{5}e+\frac{1}{3}\,ad^{2}x^{3}+\frac{1}{9}\left(3\,x^{3}\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^{2}x^{2}+1}\,x^{2}}{c^{2}}+\frac{2\sqrt{-c^{2}x^{2}+1}}{c^{4}}\right)\right)bd^{2}+\frac{2}{75}\left(15\,x^{5}\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^{2}x^{2}+1}\,x^{4}}{c^{2}}+\frac{4\sqrt{-c^{2}x^{2}+1}\,x^{2}}{c^{4}}+\frac{8\sqrt{-c^{2}x^{2}+1}}{c^{6}}\right)c\right)bde+\frac{1}{245}\left(35\,x^{7}\arcsin\left(cx\right)+\left(\frac{5\sqrt{-c^{2}x^{2}+1}\,x^{6}}{c^{2}}+\frac{6\sqrt{-c^{2}x^{2}+1}\,x^{4}}{c^{4}}+\frac{8\sqrt{-c^{2}x^{2}+1}\,x^{2}}{c^{6}}+\frac{16\sqrt{-c^{2}x^{2}+1}}{c^{8}}\right)c\right)be^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*x^7*e^2 + 2/5*a*d*x^5*e + 1/3*a*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2 + 2/75*(15*x
^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c
^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e + 1/245*(35*x^7*arcsin(c*x) + (5*sq
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*e^2
```

Fricas [A]
time = 1.64, size = 185, normalized size = 0.93

$$\frac{1575\,ac^{7}x^{7}e^{2}+4410\,ac^{7}dx^{5}e+3675\,ac^{7}d^{2}x^{3}+105\,(15\,bc^{7}x^{7}e^{2}+42\,bc^{7}dx^{5}e+35\,bc^{7}d^{2}x^{3})\arcsin\left(cx\right)+(1225\,bc^{6}d^{2}x^{2}+2450\,bc^{4}d^{2}+45\,(5\,bc^{6}x^{6}+6\,bc^{4}x^{4}+8\,bc^{2}x^{2}+16\,b)e^{2}+294\,(3\,bc^{6}dx^{4}+4\,bc^{4}dx^{2}+8\,bc^{2}d)e)\sqrt{-c^{2}x^{2}+1}}{11025\,c^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*(1575*a*c^7*x^7*e^2 + 4410*a*c^7*d*x^5*e + 3675*a*c^7*d^2*x^3 + 105
*(15*b*c^7*x^7*e^2 + 42*b*c^7*d*x^5*e + 35*b*c^7*d^2*x^3)*arcsin(c*x) + (12
25*b*c^6*d^2*x^2 + 2450*b*c^4*d^2 + 45*(5*b*c^6*x^6 + 6*b*c^4*x^4 + 8*b*c^2
*x^2 + 16*b)*e^2 + 294*(3*b*c^6*d*x^4 + 4*b*c^4*d*x^2 + 8*b*c^2*d)*e)*sqrt(
-c^2*x^2 + 1))/c^7
```

Sympy [A]
time = 0.87, size = 333, normalized size = 1.68

$$\begin{cases} \frac{ad^2x^3}{3} + \frac{2adex^5}{5} + \frac{ae^2x^7}{7} + \frac{bd^2x^3\operatorname{asin}(cx)}{3} + \frac{2bdex^5\operatorname{asin}(cx)}{5} + \frac{be^2x^7\operatorname{asin}(cx)}{7} + \frac{bd^2x^2\sqrt{-c^2x^2+1}}{9c} + \frac{2bdex^4\sqrt{-c^2x^2+1}}{25c} + \frac{be^2x^6\sqrt{-c^2x^2+1}}{49c} + \frac{2bd^2\sqrt{-c^2x^2+1}}{9c^3} + \frac{8bdex^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{6be^2x^4\sqrt{-c^2x^2+1}}{245c^3} + \frac{16bde\sqrt{-c^2x^2+1}}{75c^5} + \frac{8be^2x^2\sqrt{-c^2x^2+1}}{245c^5} + \frac{16be^2\sqrt{-c^2x^2+1}}{245c^7} & \text{for}\ c \neq 0 \\ a\left(\frac{d^2x^3}{3} + \frac{2dex^5}{5} + \frac{e^2x^7}{7}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**3/3 + 2*a*d*e*x**5/5 + a*e**2*x**7/7 + b*d**2*x**3*asi
n(c*x)/3 + 2*b*d*e*x**5*asin(c*x)/5 + b*e**2*x**7*asin(c*x)/7 + b*d**2*x**2
*sqrt(-c**2*x**2 + 1)/(9*c) + 2*b*d*e*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*
e**2*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + 2*b*d**2*sqrt(-c**2*x**2 + 1)/(9*c*
*3) + 8*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 6*b*e**2*x**4*sqrt(-c**
2*x**2 + 1)/(245*c**3) + 16*b*d*e*sqrt(-c**2*x**2 + 1)/(75*c**5) + 8*b*e**2
*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**2*sqrt(-c**2*x**2 + 1)/(245
*c**7), Ne(c, 0)), (a*(d**2*x**3/3 + 2*d*e*x**5/5 + e**2*x**7/7), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 429 vs. 2(176) = 352.
time = 0.41, size = 429, normalized size = 2.17

$$\frac{1}{7}ae^2x^7 + \frac{2}{5}adex^5 + \frac{1}{3}ad^2x^3 + \frac{(c^2x^2-1)bd^2x\arcsin(cx)}{3c^2} + \frac{bd^2x\arcsin(cx)}{3c^2} + \frac{2(c^2x^2-1)^2bdex\arcsin(cx)}{5c^4} + \frac{4(c^2x^2-1)bdex\arcsin(cx)}{5c^4} + \frac{(c^2x^2-1)^3be^2x\arcsin(cx)}{7c^6} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2}{9c^3} + \frac{2bdex\arcsin(cx)}{5c^4} + \frac{3(c^2x^2-1)^2be^2x\arcsin(cx)}{7c^6} + \frac{\sqrt{-c^2x^2+1}\,bd^2}{3c^3} + \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bde}{25c^5} + \frac{3(c^2x^2-1)be^2x\arcsin(cx)}{7c^6} - \frac{4(-c^2x^2+1)^{\frac{3}{2}}bde}{15c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,be^2}{49c^7} + \frac{be^2x\arcsin(cx)}{7c^6} + \frac{2\sqrt{-c^2x^2+1}\,bde}{5c^5} + \frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^2}{35c^7} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2}{7c^7} + \frac{\sqrt{-c^2x^2+1}\,be^2}{7c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*e^2*x^7 + 2/5*a*d*e*x^5 + 1/3*a*d^2*x^3 + 1/3*(c^2*x^2 - 1)*b*d^2*x*a
rcsin(c*x)/c^2 + 1/3*b*d^2*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*b*d*e*x*
arcsin(c*x)/c^4 + 4/5*(c^2*x^2 - 1)*b*d*e*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2
- 1)^3*b*e^2*x*arcsin(c*x)/c^6 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^3 + 2/5*b
*d*e*x*arcsin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*e^2*x*arcsin(c*x)/c^6 + 1/3*
sqrt(-c^2*x^2 + 1)*b*d^2/c^3 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*
e/c^5 + 3/7*(c^2*x^2 - 1)*b*e^2*x*arcsin(c*x)/c^6 - 4/15*(-c^2*x^2 + 1)^(3/
2)*b*d*e/c^5 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^2/c^7 + 1/7*b*e^
2*x*arcsin(c*x)/c^6 + 2/5*sqrt(-c^2*x^2 + 1)*b*d*e/c^5 + 3/35*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b*e^2/c^7 - 1/7*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^7 + 1/7*
sqrt(-c^2*x^2 + 1)*b*e^2/c^7
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^2 (a + b\,\mathrm{asin}(c\,x))\,\left(e\,x^2 + d\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^2,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.608 $\int x(d+ex^2)^2(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=183

$$\frac{b(44c^4d^2+44c^2de+15e^2)\,x\sqrt{1-c^2x^2}}{288c^5}+\frac{5b(2c^2d+e)\,x\sqrt{1-c^2x^2}\,(d+ex^2)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}\,(d+ex^2)^2}{36c}-\frac{b(}{}$$

```
[Out] -1/96*b*(2*c^2*d+e)*(8*c^4*d^2+8*c^2*d*e+5*e^2)*arcsin(c*x)/c^6/e+1/6*(e*x^
2+d)^3*(a+b*arcsin(c*x))/e+1/288*b*(44*c^4*d^2+44*c^2*d*e+15*e^2)*x*(-c^2*x
^2+1)^(1/2)/c^5+5/144*b*(2*c^2*d+e)*x*(e*x^2+d)*(-c^2*x^2+1)^(1/2)/c^3+1/36
*b*x*(e*x^2+d)^2*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.13, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {4813, 427, 542, 396, 222}

$$\frac{(d+ex^2)^3\,(a+b\text{ArcSin}(cx))}{6e}-\frac{b\text{ArcSin}(cx)\,(2c^2d+e)\,(8c^4d^2+8c^2de+5e^2)}{96c^6e}+\frac{bx\sqrt{1-c^2x^2}\,(d+ex^2)^2}{36c}+\frac{5bx\sqrt{1-c^2x^2}\,(2c^2d+e)\,(d+ex^2)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}\,(44c^4d^2+44c^2de+15e^2)}{288c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(44*c^4*d^2 + 44*c^2*d*e + 15*e^2)*x*Sqrt[1 - c^2*x^2])/(288*c^5) + (5*b
*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(144*c^3) + (b*x*Sqrt[1 - c
^2*x^2]*(d + e*x^2)^2)/(36*c) - (b*(2*c^2*d + e)*(8*c^4*d^2 + 8*c^2*d*e + 5
*e^2)*ArcSin[c*x])/(96*c^6*e) + ((d + e*x^2)^3*(a + b*ArcSin[c*x]))/(6*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 427

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[d*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q - 1)/(b*(n*(p + q) + 1))),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
```

```
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 542

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[f*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^q/(
b*(n*(p + q + 1) + 1))), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^3}{\sqrt{1-c^2x^2}}\,dx}{6e}$$

$$=\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{36c}+\frac{\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)}{6e}+\frac{b\int\frac{\left(d+ex^2\right)(-}{}}{}$$

$$=\frac{5b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{36c}+\frac{(d+}{}$$

$$=\frac{b\left(44c^4d^2+44c^2de+15e^2\right)x\sqrt{1-c^2x^2}}{288c^5}+\frac{5b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\,(d}{144c^3}$$

$$=\frac{b\left(44c^4d^2+44c^2de+15e^2\right)x\sqrt{1-c^2x^2}}{288c^5}+\frac{5b\left(2c^2d+e\right)x\sqrt{1-c^2x^2}\,(d}{144c^3}$$

Mathematica [A]
time = 0.10, size = 159, normalized size = 0.87

$$\frac{cx\left(48ac^5x\left(3d^2+3dex^2+e^2x^4\right)+b\sqrt{1-c^2x^2}\left(15e^2+2c^2e\left(27d+5ex^2\right)+4c^4\left(18d^2+9dex^2+2e^2x^4\right)\right)\right)+3b\left(-24c^4d^2-18c^2de-5e^2+16c^6\left(3d^2x^2+3dex^4+e^2x^6\right)\right)\mathrm{ArcSin}(cx)}{288c^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

[Out] (c*x*(48*a*c^5*x*(3*d^2 + 3*d*e*x^2 + e^2*x^4) + b*Sqrt[1 - c^2*x^2]*(15*e^2 + 2*c^2*e*(27*d + 5*e*x^2) + 4*c^4*(18*d^2 + 9*d*e*x^2 + 2*e^2*x^4))) + 3*b*(-24*c^4*d^2 - 18*c^2*d*e - 5*e^2 + 16*c^6*(3*d^2*x^2 + 3*d*e*x^4 + e^2*x^6))*ArcSin[c*x])/(288*c^6)

Maple [A]

time = 0.13, size = 264, normalized size = 1.44

method	result
derivativedivides	$\frac{\frac{\left(c^{2} e\,x^{2}+c^{2} d\right)^{3} a}{6 c^{4} e}+\frac{b \left(\frac{\arcsin \left(c x \right) c^{6} d^{3}}{6 e}+\frac{\arcsin \left(c x \right) c^{6} d^{2} x^{2}}{2}+\frac{e \arcsin \left(c x \right) c^{6} d\,x^{4}}{2}+\frac{e^{2} \arcsin \left(c x \right) c^{6} x^{6}}{6}-\frac{c^{6} d^{3} \arcsin \left(c x \right)+3 d^{2} c^{4} e \left(-\frac{c x \sqrt{}}{}\right.}{}\right)}{}}{}$
default	$\frac{\frac{\left(c^{2} e\,x^{2}+c^{2} d\right)^{3} a}{6 c^{4} e}+\frac{b \left(\frac{\arcsin \left(c x \right) c^{6} d^{3}}{6 e}+\frac{\arcsin \left(c x \right) c^{6} d^{2} x^{2}}{2}+\frac{e \arcsin \left(c x \right) c^{6} d\,x^{4}}{2}+\frac{e^{2} \arcsin \left(c x \right) c^{6} x^{6}}{6}-\frac{c^{6} d^{3} \arcsin \left(c x \right)+3 d^{2} c^{4} e \left(-\frac{c x \sqrt{}}{}\right.}{}\right)}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/c^2*(1/6*(c^2*e*x^2+c^2*d)^3*a/c^4/e+b/c^4*(1/6/e*arcsin(c*x)*c^6*d^3+1/2*arcsin(c*x)*c^6*d^2*x^2+1/2*e*arcsin(c*x)*c^6*d*x^4+1/6*e^2*arcsin(c*x)*c^6*x^6-1/6/e*(c^6*d^3*arcsin(c*x)+3*d^2*c^4*e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+3*d*c^2*e^2*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+e^3*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x)))))

Maxima [A]

time = 0.47, size = 223, normalized size = 1.22

$$\frac{1}{6}\,ax^{6}e^{2}+\frac{1}{2}\,adx^{4}e+\frac{1}{2}\,ad^{2}x^{2}+\frac{1}{4}\,\left(2\,x^{2}\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^{2}x^{2}+1}\,x}{c^{2}}-\frac{\arcsin\left(cx\right)}{c^{3}}\right)\right)bd^{2}+\frac{1}{16}\,\left(8\,x^{4}\arcsin\left(cx\right)+\left(\frac{2\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{2}}+\frac{3\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{4}}-\frac{3\,\arcsin\left(cx\right)}{c^{5}}\right)c\right)bde+\frac{1}{288}\,\left(48\,x^{6}\arcsin\left(cx\right)+\left(\frac{8\,\sqrt{-c^{2}x^{2}+1}\,x^{5}}{c^{2}}+\frac{10\,\sqrt{-c^{2}x^{2}+1}\,x^{3}}{c^{4}}+\frac{15\,\sqrt{-c^{2}x^{2}+1}\,x}{c^{6}}-\frac{15\,\arcsin\left(cx\right)}{c^{7}}\right)c\right)be^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] 1/6*a*x^6*e^2 + 1/2*a*d*x^4*e + 1/2*a*d^2*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*e^2

Fricas [A]
time = 1.14, size = 181, normalized size = 0.99

$$\frac{48\,ac^6x^6e^2 + 144\,ac^6dx^4e + 144\,ac^6d^2x^2 + 3\,(48\,bc^6d^2x^2 - 24\,bc^4d^2 + (16\,bc^6x^6 - 5\,b)e^2 + 6\,(8\,bc^6dx^4 - 3\,bc^2d)e)\arcsin(cx) + (72\,bc^5d^2x + (8\,bc^5x^5 + 10\,bc^3x^3 + 15\,bcx)e^2 + 18\,(2\,bc^5dx^3 + 3\,bc^3dx)e)\sqrt{-c^2x^2+1}}{288\,c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*x^6*e^2 + 144*a*c^6*d*x^4*e + 144*a*c^6*d^2*x^2 + 3*(48*b*c
^6*d^2*x^2 - 24*b*c^4*d^2 + (16*b*c^6*x^6 - 5*b)*e^2 + 6*(8*b*c^6*d*x^4 - 3
*b*c^2*d)*e)*arcsin(c*x) + (72*b*c^5*d^2*x + (8*b*c^5*x^5 + 10*b*c^3*x^3 +
15*b*c*x)*e^2 + 18*(2*b*c^5*d*x^3 + 3*b*c^3*d*x)*e)*sqrt(-c^2*x^2 + 1))/c^6
```

Sympy [A]
time = 0.70, size = 299, normalized size = 1.63

$$\begin{cases} \frac{ad^2x^2}{2} + \frac{adex^4}{2} + \frac{ae^2x^6}{6} + \frac{bd^2x^2\operatorname{asin}(cx)}{2} + \frac{bdex^4\operatorname{asin}(cx)}{2} + \frac{be^2x^6\operatorname{asin}(cx)}{6} + \frac{bd^2x\sqrt{-c^2x^2+1}}{4c} + \frac{bdex^3\sqrt{-c^2x^2+1}}{8c} + \frac{be^2x^5\sqrt{-c^2x^2+1}}{36c} - \frac{bd^2\operatorname{asin}(cx)}{4c^2} + \frac{3bdex\sqrt{-c^2x^2+1}}{16c^3} + \frac{5be^2x^3\sqrt{-c^2x^2+1}}{144c^3} - \frac{3bde\operatorname{asin}(cx)}{16c^4} + \frac{5be^2x\sqrt{-c^2x^2+1}}{96c^5} - \frac{5be^2\operatorname{asin}(cx)}{96c^6} & \text{for}\ c \neq 0 \\ a\left(\frac{d^2x^2}{2} + \frac{dex^4}{2} + \frac{e^2x^6}{6}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**2/2 + a*d*e*x**4/2 + a*e**2*x**6/6 + b*d**2*x**2*asin(
c*x)/2 + b*d*e*x**4*asin(c*x)/2 + b*e**2*x**6*asin(c*x)/6 + b*d**2*x*sqrt(-
c**2*x**2 + 1)/(4*c) + b*d*e*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + b*e**2*x**5*
sqrt(-c**2*x**2 + 1)/(36*c) - b*d**2*asin(c*x)/(4*c**2) + 3*b*d*e*x*sqrt(-c
**2*x**2 + 1)/(16*c**3) + 5*b*e**2*x**3*sqrt(-c**2*x**2 + 1)/(144*c**3) - 3
*b*d*e*asin(c*x)/(16*c**4) + 5*b*e**2*x*sqrt(-c**2*x**2 + 1)/(96*c**5) - 5*
b*e**2*asin(c*x)/(96*c**6), Ne(c, 0)), (a*(d**2*x**2/2 + d*e*x**4/2 + e**2*
x**6/6), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 350 vs. 2(167) = 334.
time = 0.42, size = 350, normalized size = 1.91

$$\frac{1}{6}\,ae^2x^6 + \frac{1}{2}\,adex^4 + \frac{\sqrt{-c^2x^2+1}\,bd^2x}{4\,c} + \frac{(c^2x^2-1)bd^2\arcsin(cx)}{2\,c^2} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdex}{8\,c^3} + \frac{(c^2x^2-1)ad^2}{2\,c^2} + \frac{bd^2\arcsin(cx)}{4\,c^2} + \frac{(c^2x^2-1)^2bde\arcsin(cx)}{2\,c^4} + \frac{5\,\sqrt{-c^2x^2+1}\,bdex}{16\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^2x}{36\,c^5} + \frac{(c^2x^2-1)bde\arcsin(cx)}{c^4} + \frac{(c^2x^2-1)^3be^2\arcsin(cx)}{6\,c^6} - \frac{13\,(-c^2x^2+1)^{\frac{3}{2}}be^2x}{144\,c^5} + \frac{5\,bde\arcsin(cx)}{16\,c^4} + \frac{(c^2x^2-1)^2be^2\arcsin(cx)}{2\,c^6} + \frac{11\,\sqrt{-c^2x^2+1}\,be^2x}{96\,c^5} + \frac{(c^2x^2-1)be^2\arcsin(cx)}{2\,c^6} + \frac{11\,be^2\arcsin(cx)}{96\,c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/6*a*e^2*x^6 + 1/2*a*d*e*x^4 + 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*x/c + 1/2*(c^2
*x^2 - 1)*b*d^2*arcsin(c*x)/c^2 - 1/8*(-c^2*x^2 + 1)^(3/2)*b*d*e*x/c^3 + 1/
2*(c^2*x^2 - 1)*a*d^2/c^2 + 1/4*b*d^2*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)^2
*b*d*e*arcsin(c*x)/c^4 + 5/16*sqrt(-c^2*x^2 + 1)*b*d*e*x/c^3 + 1/36*(c^2*x^
2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^2*x/c^5 + (c^2*x^2 - 1)*b*d*e*arcsin(c*x)/c
^4 + 1/6*(c^2*x^2 - 1)^3*b*e^2*arcsin(c*x)/c^6 - 13/144*(-c^2*x^2 + 1)^(3/2
```

```
)*b*e^2*x/c^5 + 5/16*b*d*e*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*e^2*arcs
in(c*x)/c^6 + 11/96*sqrt(-c^2*x^2 + 1)*b*e^2*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e^
2*arcsin(c*x)/c^6 + 11/96*b*e^2*arcsin(c*x)/c^6
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d + e*x^2)^2,x)
[Out] int(x*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.609 $\int (d+ex^2)^2 (a+b\mathbf{ArcSin}(cx))\, dx$

Optimal. Leaf size=150

$$\frac{b(15c^4d^2+10c^2de+3e^2)\sqrt{1-c^2x^2}}{15c^5}-\frac{2be(5c^2d+3e)(1-c^2x^2)^{3/2}}{45c^5}+\frac{be^2(1-c^2x^2)^{5/2}}{25c^5}+d^2x(a+b\text{ArcSin}(cx))$$

```
[Out] -2/45*b*e*(5*c^2*d+3*e)*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e^2*(-c^2*x^2+1)^(5/2
)/c^5+d^2*x*(a+b*arcsin(c*x))+2/3*d*e*x^3*(a+b*arcsin(c*x))+1/5*e^2*x^5*(a+
b*arcsin(c*x))+1/15*b*(15*c^4*d^2+10*c^2*d*e+3*e^2)*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A]
time = 0.10, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.278$, Rules used = {200, 4755, 12, 1261, 712}

$$d^2x(a+b\text{ArcSin}(cx))+\frac{2}{3}dex^3(a+b\text{ArcSin}(cx))+\frac{1}{5}e^2x^5(a+b\text{ArcSin}(cx))-\frac{2be(1-c^2x^2)^{3/2}(5c^2d+3e)}{45c^5}+\frac{be^2(1-c^2x^2)^{5/2}}{25c^5}+\frac{b\sqrt{1-c^2x^2}(15c^4d^2+10c^2de+3e^2)}{15c^5}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(15*c^4*d^2 + 10*c^2*d*e + 3*e^2)*Sqrt[1 - c^2*x^2])/(15*c^5) - (2*b*e*(
5*c^2*d + 3*e)*(1 - c^2*x^2)^(3/2))/(45*c^5) + (b*e^2*(1 - c^2*x^2)^(5/2))/
(25*c^5) + d^2*x*(a + b*ArcSin[c*x]) + (2*d*e*x^3*(a + b*ArcSin[c*x]))/3 +
(e^2*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\int (d+ex^2)^2 \left(a+b\sin^{-1}(cx)\right) dx = d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= d^2x\left(a+b\sin^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\sin^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= \frac{b(15c^4d^2+10c^2de+3e^2)\sqrt{1-c^2x^2}}{15c^5}-\frac{2be(5c^2d+3e)\left(1-c^2x^2\right)^{3/2}}{45c^5}$$

Mathematica [A]
time = 0.10, size = 125, normalized size = 0.83

$$\frac{1}{225}\left(15ax(15d^2+10dex^2+3e^2x^4)+\frac{b\sqrt{1-c^2x^2}\,(24e^2+4c^2e(25d+3ex^2)+c^4(225d^2+50dex^2+9e^2x^4))}{c^5}+15bx(15d^2+10dex^2+3e^2x^4)\,\mathrm{ArcSin}(cx)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
[Out] (15*a*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(24*e^2 +
4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*d*e*x^2 + 9*e^2*x^4)))/c^5 + 1
5*b*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4)*ArcSin[c*x])/225
```

Maple [A]
time = 0.09, size = 209, normalized size = 1.39

method	result
derivativedivides	$\frac{a\left(d^2c^5x+\frac{2}{3}d\,c^5e\,x^3+\frac{1}{5}e^2c^5x^5\right)}{c^4}+\frac{b\left(\arcsin(cx)d^2c^5x+\frac{2\arcsin(cx)d\,c^5e\,x^3}{3}+\frac{\arcsin(cx)e^2c^5x^5}{5}+d^2c^4\sqrt{-c^2x^2+1}-\frac{2d\,c^2e\left(-\right.}{}\right.}{}$
default	$\frac{a\left(d^2c^5x+\frac{2}{3}d\,c^5e\,x^3+\frac{1}{5}e^2c^5x^5\right)}{c^4}+\frac{b\left(\arcsin(cx)d^2c^5x+\frac{2\arcsin(cx)d\,c^5e\,x^3}{3}+\frac{\arcsin(cx)e^2c^5x^5}{5}+d^2c^4\sqrt{-c^2x^2+1}-\frac{2d\,c^2e\left(-\right.}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/c^4*(d^2*c^5*x+2/3*d*c^5*e*x^3+1/5*e^2*c^5*x^5)+b/c^4*(arcsin(c*x)*d
^2*c^5*x+2/3*arcsin(c*x)*d*c^5*e*x^3+1/5*arcsin(c*x)*e^2*c^5*x^5+d^2*c^4*(-
c^2*x^2+1)^(1/2)-2/3*d*c^2*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2
+1)^(1/2))-1/5*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+
1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.48, size = 182, normalized size = 1.21

$$\frac{1}{5}\,ax^5e^2+\frac{2}{3}\,adx^3e+ad^2x+\frac{2}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde+\frac{\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bd^2}{c}+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*x^5*e^2 + 2/3*a*d*x^3*e + a*d^2*x + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e + (c*x*arcsin(c*x)
 + sqrt(-c^2*x^2 + 1))*b*d^2/c + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^
2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c
)*b*e^2
```

Fricas [A]
time = 0.94, size = 149, normalized size = 0.99

$$\frac{45\,ac^5x^5e^2+150\,ac^5dx^3e+225\,ac^5d^2x+15\,(3\,bc^5x^5e^2+10\,bc^5dx^3e+15\,bc^5d^2x)\arcsin\left(cx\right)+(225\,bc^4d^2+3\,(3\,bc^4x^4+4\,bc^2x^2+8\,b)e^2+50\,(bc^4dx^2+2\,bc^2d)e)\sqrt{-c^2x^2+1}}{225\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*x^5*e^2 + 150*a*c^5*d*x^3*e + 225*a*c^5*d^2*x + 15*(3*b*c^5
*x^5*e^2 + 10*b*c^5*d*x^3*e + 15*b*c^5*d^2*x)*arcsin(c*x) + (225*b*c^4*d^2
```

```
+ 3*(3*b*c^4*x^4 + 4*b*c^2*x^2 + 8*b)*e^2 + 50*(b*c^4*d*x^2 + 2*b*c^2*d)*e)
*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 0.37, size = 240, normalized size = 1.60

$$\begin{cases} ad^2x + \frac{2adex^3}{3} + \frac{ae^2x^5}{5} + bd^2x\operatorname{asin}(cx) + \frac{2bdex^3\operatorname{asin}(cx)}{3} + \frac{be^2x^5\operatorname{asin}(cx)}{5} + \frac{bd^2\sqrt{-c^2x^2+1}}{c} + \frac{2bdex^2\sqrt{-c^2x^2+1}}{9c} + \frac{be^2x^4\sqrt{-c^2x^2+1}}{25c} + \frac{4bde\sqrt{-c^2x^2+1}}{9c^3} + \frac{4be^2x^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{8be^2\sqrt{-c^2x^2+1}}{75c^5} & \text{for } c \neq 0 \\ a\left(d^2x + \frac{2dex^3}{3} + \frac{e^2x^5}{5}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x + 2*a*d*e*x**3/3 + a*e**2*x**5/5 + b*d**2*x*asin(c*x) +
 2*b*d*e*x**3*asin(c*x)/3 + b*e**2*x**5*asin(c*x)/5 + b*d**2*sqrt(-c**2*x**
2 + 1)/c + 2*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*x**4*sqrt(-c**2
*x**2 + 1)/(25*c) + 4*b*d*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*e**2*x**2*s
qrt(-c**2*x**2 + 1)/(75*c**3) + 8*b*e**2*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne
(c, 0)), (a*(d**2*x + 2*d*e*x**3/3 + e**2*x**5/5), True))
```

Giac [A]
time = 0.44, size = 265, normalized size = 1.77

$$\frac{1}{5}ae^2x^5 + \frac{2}{3}adex^3 + bd^2x\arcsin(cx) + ad^2x + \frac{2(c^2x^2-1)bdex\arcsin(cx)}{3c^2} + \frac{2bdex\arcsin(cx)}{3c^2} + \frac{(c^2x^2-1)^2be^2x\arcsin(cx)}{5c^4} + \frac{\sqrt{-c^2x^2+1}\,bd^2}{c} + \frac{2(c^2x^2-1)be^2x\arcsin(cx)}{5c^4} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bde}{9c^3} + \frac{be^2x\arcsin(cx)}{5c^4} + \frac{2\sqrt{-c^2x^2+1}\,bde}{3c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^2}{25c^5} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}be^2}{15c^5} + \frac{\sqrt{-c^2x^2+1}\,be^2}{5c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*e^2*x^5 + 2/3*a*d*e*x^3 + b*d^2*x*arcsin(c*x) + a*d^2*x + 2/3*(c^2*x^
2 - 1)*b*d*e*x*arcsin(c*x)/c^2 + 2/3*b*d*e*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2
 - 1)^2*b*e^2*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^2/c + 2/5*(c^2*x^2
 - 1)*b*e^2*x*arcsin(c*x)/c^4 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e/c^3 + 1/5*b*
e^2*x*arcsin(c*x)/c^4 + 2/3*sqrt(-c^2*x^2 + 1)*b*d*e/c^3 + 1/25*(c^2*x^2 -
1)^2*sqrt(-c^2*x^2 + 1)*b*e^2/c^5 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^5 + 1
/5*sqrt(-c^2*x^2 + 1)*b*e^2/c^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\operatorname{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.610 $\int \frac{(d+ex^2)^2(a+b\mathbf{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=229

$$\frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\text{ArcSin}(cx)}{2c^2}-\frac{3be^2\text{ArcSin}(cx)}{32c^4}-\frac{1}{2}ibd^2\text{ArcSin}(cx)^2$$

```
[Out] -1/2*b*d*e*arcsin(c*x)/c^2-3/32*b*e^2*arcsin(c*x)/c^4-1/2*I*b*d^2*arcsin(c*
x)^2+d*e*x^2*(a+b*arcsin(c*x))+1/4*e^2*x^4*(a+b*arcsin(c*x))+b*d^2*arcsin(c
*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*d^2*arcsin(c*x)*ln(x)+d^2*(a+b*arc
sin(c*x))*ln(x)-1/2*I*b*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b*d
*e*x*(-c^2*x^2+1)^(1/2)/c+3/32*b*e^2*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e^2*x^
3*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.24, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {272, 45, 4815, 6874, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$d^2\log(x)(a+b\text{ArcSin}(cx))+dex^2(a+b\text{ArcSin}(cx))+\frac{1}{4}e^2x^4(a+b\text{ArcSin}(cx))-\frac{3be^2\text{ArcSin}(cx)}{32c^4}-\frac{bde\text{ArcSin}(cx)}{2c^2}-\frac{1}{2}ibd^2\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{2}ibd^2\text{ArcSin}(cx)^2+bd^2\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-bd^2\log(x)\text{ArcSin}(cx)+\frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (b*d*e*x*Sqrt[1 - c^2*x^2])/(2*c) + (3*b*e^2*x*Sqrt[1 - c^2*x^2])/(32*c^3)
+ (b*e^2*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (b*d*e*ArcSin[c*x])/(2*c^2) - (3*b
*e^2*ArcSin[c*x])/(32*c^4) - (I/2)*b*d^2*ArcSin[c*x]^2 + d*e*x^2*(a + b*Arc
Sin[c*x]) + (e^2*x^4*(a + b*ArcSin[c*x]))/4 + b*d^2*ArcSin[c*x]*Log[1 - E^(
(2*I)*ArcSin[c*x])] - b*d^2*ArcSin[c*x]*Log[x] + d^2*(a + b*ArcSin[c*x])*Lo
g[x] - (I/2)*b*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\sin^{-1}(cx)\right)}{x}\,dx = dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+d^2\left(a+b\sin^{-1}(cx)\right)\mathrm{lo}$$

$$= dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+d^2\left(a+b\sin^{-1}(cx)\right)\mathrm{lo}$$

$$= dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\sin^{-1}(cx)\right)+d^2\left(a+b\sin^{-1}(cx)\right)\mathrm{lo}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}+dex^2\left(a+b\sin^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a\right.$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx}{2c^2}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx}{2c^2}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx}{2c^2}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx}{2c^2}$$

$$= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\sin^{-1}(cx}{2c^2}$$

Mathematica [A]
time = 0.22, size = 218, normalized size = 0.95

$$\frac{1}{4}\left(4adex^2+ae^2x^4+4bdex^2\mathrm{ArcSin}(cx)+be^2x^4\mathrm{ArcSin}(cx)+\frac{be^2\left(cx\sqrt{1-c^2x^2}\left(3+2c^2x^2\right)-6\mathrm{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{8c^4}+\frac{2bde\left(cx\sqrt{1-c^2x^2}-2\mathrm{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^2}+4bd^2\mathrm{ArcSin}(cx)\log\left(1-e^{2i\mathrm{ArcSin}(cx)}\right)+4ad^2\log(x)-2ibd^2\left(\mathrm{ArcSin}(cx)^2+\mathrm{PolyLog}\left(2,e^{2i\mathrm{ArcSin}(cx)}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (4*a*d*e*x^2 + a*e^2*x^4 + 4*b*d*e*x^2*ArcSin[c*x] + b*e^2*x^4*ArcSin[c*x]
+ (b*e^2*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) - 6*ArcTan[(c*x)/(-1 + Sqrt
[1 - c^2*x^2])]))/(8*c^4) + (2*b*d*e*(c*x*Sqrt[1 - c^2*x^2] - 2*ArcTan[(c*x
)/(-1 + Sqrt[1 - c^2*x^2])]))/c^2 + 4*b*d^2*ArcSin[c*x]*Log[1 - E^((2*I)*Ar
cSin[c*x])] + 4*a*d^2*Log[x] - (2*I)*b*d^2*(ArcSin[c*x]^2 + PolyLog[2, E^((
2*I)*ArcSin[c*x])]))/4
```

Maple [A]
time = 0.31, size = 262, normalized size = 1.14

method	result
derivativedivides	$ade\,x^2+\frac{a\,e^2x^4}{4}+a\,d^2\ln(cx)-\frac{ib\,d^2\arcsin(cx)^2}{2}+b\,d^2\arcsin(cx)\ln\left(1-icx-\sqrt{-c^2x^2+1}\right.$
default	$ade\,x^2+\frac{a\,e^2x^4}{4}+a\,d^2\ln(cx)-\frac{ib\,d^2\arcsin(cx)^2}{2}+b\,d^2\arcsin(cx)\ln\left(1-icx-\sqrt{-c^2x^2+1}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] a*d*e*x^2+1/4*a*e^2*x^4+a*d^2*ln(c*x)-1/2*I*b*d^2*arcsin(c*x)^2+b*d^2*arcsi
n(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+b*d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^
2+1)^(1/2))-I*b*d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*b*d^2*polylog(2,
I*c*x+(-c^2*x^2+1)^(1/2))+1/32*b/c^4*arcsin(c*x)*e^2*cos(4*arcsin(c*x))-1/1
28*b/c^4*e^2*sin(4*arcsin(c*x))-1/2*b/c^2*arcsin(c*x)*cos(2*arcsin(c*x))*d*
e-1/8*b/c^4*arcsin(c*x)*cos(2*arcsin(c*x))*e^2+1/4*b/c^2*sin(2*arcsin(c*x))
*d*e+1/16*b/c^4*sin(2*arcsin(c*x))*e^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4*e^2 + a*d*x^2*e + a*d^2*log(x) + integrate((b*x^4*e^2 + 2*b*d*x^2
*e + b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*x^4*e^2 + 2*a*d*x^2*e + a*d^2 + (b*x^4*e^2 + 2*b*d*x^2*e + b*d^
2)*arcsin(c*x))/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}{(cx)}) (d + ex^2)^2}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**2/x, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))\ (e\,x^2 + d)^2}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x, x)
```

3.611 $\int \frac{(d+ex^2)^2(a+b\text{ArcSin}(cx))}{x^2} dx$

Optimal. Leaf size=126

$$\frac{be(6c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{be^2(1-c^2x^2)^{3/2}}{9c^3}-\frac{d^2(a+b\text{ArcSin}(cx))}{x}+2dex(a+b\text{ArcSin}(cx))+\frac{1}{3}e^2x^3(a+b\text{ArcS}$$

```
[Out] -1/9*b*e^2*(-c^2*x^2+1)^(3/2)/c^3-d^2*(a+b*arcsin(c*x))/x+2*d*e*x*(a+b*arcs
in(c*x))+1/3*e^2*x^3*(a+b*arcsin(c*x))-b*c*d^2*arctanh((-c^2*x^2+1)^(1/2))+
1/3*b*e*(6*c^2*d+e)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A]
time = 0.13, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {276, 4815, 1265, 911, 1167, 214}

$$-\frac{d^2(a+b\text{ArcSin}(cx))}{x}+2dex(a+b\text{ArcSin}(cx))+\frac{1}{3}e^2x^3(a+b\text{ArcSin}(cx))-bcd^2\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be\sqrt{1-c^2x^2}(6c^2d+e)}{3c^3}-\frac{be^2(1-c^2x^2)^{3/2}}{9c^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*(6*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e^2*(1 - c^2*x^2)^(3/2))
/(9*c^3) - (d^2*(a + b*ArcSin[c*x]))/x + 2*d*e*x*(a + b*ArcSin[c*x]) + (e^2
*x^3*(a + b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)^2(a+b\sin^{-1}(cx))}{x^2}\,dx = -\frac{d^2(a+b\sin^{-1}(cx))}{x} + 2dex\left(a+b\sin^{-1}(cx)\right) + \frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{x} + 2dex\left(a+b\sin^{-1}(cx)\right) + \frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{x} + 2dex\left(a+b\sin^{-1}(cx)\right) + \frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{x} + 2dex\left(a+b\sin^{-1}(cx)\right) + \frac{1}{3}e^2x^3\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{be(6c^2d+e)\sqrt{1-c^2x^2}}{3c^3} - \frac{be^2(1-c^2x^2)^{3/2}}{9c^3} - \frac{d^2(a+b\sin^{-1}(cx))}{x} + 2d$$

$$= \frac{be(6c^2d+e)\sqrt{1-c^2x^2}}{3c^3} - \frac{be^2(1-c^2x^2)^{3/2}}{9c^3} - \frac{d^2(a+b\sin^{-1}(cx))}{x} + 2d$$

Mathematica [A]

time = 0.10, size = 129, normalized size = 1.02

$$\frac{1}{9}\left(-\frac{9ad^2}{x}+18adex+3ae^2x^3+\frac{be\sqrt{1-c^2x^2}\,(2e+c^2(18d+ex^2))}{c^3}+\frac{3b(-3d^2+6dex^2+e^2x^4)\,\mathrm{ArcSin}(cx)}{x}+9bcd^2\log(x)-9bcd^2\log\left(1+\sqrt{1-c^2x^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] ((-9*a*d^2)/x + 18*a*d*e*x + 3*a*e^2*x^3 + (b*e*Sqrt[1 - c^2*x^2]*(2*e + c^
2*(18*d + e*x^2)))/c^3 + (3*b*(-3*d^2 + 6*d*e*x^2 + e^2*x^4)*ArcSin[c*x])/x
 + 9*b*c*d^2*Log[x] - 9*b*c*d^2*Log[1 + Sqrt[1 - c^2*x^2]])/9
```

Maple [A]
time = 0.11, size = 168, normalized size = 1.33

method	result
derivativedivides	$c\left(\frac{a\left(2c^3dex+\frac{e^2c^3x^3}{3}-\frac{c^3d^2}{x}\right)}{c^4}+\frac{b\left(2\arcsin(cx)c^3dex+\frac{\arcsin(cx)e^2c^3x^3}{3}-\frac{\arcsin(cx)c^3d^2}{x}+2c^2de\sqrt{-c^2x^2+1}-\right.}{}\right.$
default	$c\left(\frac{a\left(2c^3dex+\frac{e^2c^3x^3}{3}-\frac{c^3d^2}{x}\right)}{c^4}+\frac{b\left(2\arcsin(cx)c^3dex+\frac{\arcsin(cx)e^2c^3x^3}{3}-\frac{\arcsin(cx)c^3d^2}{x}+2c^2de\sqrt{-c^2x^2+1}-\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(a/c^4*(2*c^3*d*e*x+1/3*e^2*c^3*x^3-c^3*d^2/x)+b/c^4*(2*arcsin(c*x)*c^3*d
*e*x+1/3*arcsin(c*x)*e^2*c^3*x^3-arcsin(c*x)*c^3*d^2/x+2*c^2*d*e*(-c^2*x^2+
1)^(1/2)-1/3*e^2*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-c
^4*d^2*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.48, size = 151, normalized size = 1.20

$$\frac{1}{3}ax^3e^2-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd^2+2adxe+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2+\frac{2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bde}{c}-\frac{ad^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*x^3*e^2 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x
)/x)*b*d^2 + 2*a*d*x*e + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2
/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2 + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^
2 + 1))*b*d*e/c - a*d^2/x
```

Fricas [A]
time = 1.07, size = 170, normalized size = 1.35

$$\frac{6\,ac^3x^4e^2 - 9\,bc^4d^2x\log\left(\sqrt{-c^2x^2+1}+1\right) + 9\,bc^4d^2x\log\left(\sqrt{-c^2x^2+1}-1\right) + 36\,ac^3dx^2e - 18\,ac^3d^2 + 6\,(bc^3x^4e^2 + 6\,bc^3dx^2e - 3\,bc^3d^2)\arcsin(cx) + 2\,(18\,bc^2dxe + (bc^2x^3 + 2\,bx)e^2)\sqrt{-c^2x^2+1}}{18\,c^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/18*(6*a*c^3*x^4*e^2 - 9*b*c^4*d^2*x*log(sqrt(-c^2*x^2 + 1) + 1) + 9*b*c^4
*d^2*x*log(sqrt(-c^2*x^2 + 1) - 1) + 36*a*c^3*d*x^2*e - 18*a*c^3*d^2 + 6*(b
*c^3*x^4*e^2 + 6*b*c^3*d*x^2*e - 3*b*c^3*d^2)*arcsin(c*x) + 2*(18*b*c^2*d*x
*e + (b*c^2*x^3 + 2*b*x)*e^2)*sqrt(-c^2*x^2 + 1))/(c^3*x)
```

Sympy [A]
time = 3.42, size = 167, normalized size = 1.33

$$-\frac{ad^2}{x} + 2adex + \frac{ae^2x^3}{3} + bcd^2\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bce^2\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3} - \frac{bd^2\operatorname{asin}(cx)}{x} + 2bde\left(\begin{cases} 0 & \text{for}\ c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + \frac{be^2x^3\operatorname{asin}(cx)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d**2/x + 2*a*d*e*x + a*e**2*x**3/3 + b*c*d**2*Piecewise((-acosh(1/(c*x))
, 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*e**2*Piecewise((-x*
*2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c, 0
)), (x**4/4, True))/3 - b*d**2*asin(c*x)/x + 2*b*d*e*Piecewise((0, Eq(c, 0)
), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*e**2*x**3*asin(c*x)/3
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 4243 vs. 2(114) = 228.
time = 1.92, size = 4243, normalized size = 33.67

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^12*d^2*x^8*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c
^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
```

c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/2*a*c^12*d^
2*x^8/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + b*c^11*d^2*x^7*log(abs(c)*abs(x))/((c^1
0*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3
*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt
(-c^2*x^2 + 1) + 1)^7) - b*c^11*d^2*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^10*
x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c
^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-
c^2*x^2 + 1) + 1)^7) - 2*b*c^10*d^2*x^6*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x
^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^6) - 2*a*c^10*d^2*x^6/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(
sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(s
qrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 3*b*c^9*d^2*x^5*log(a
bs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^9*d^2*x^5*log(sqrt(-c^2*x
^2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^
2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 2*b*c^9*d*e*x^7/((c^10*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)^7) + 4*b*c^8*d*e*x^6*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 3*b
*c^8*d^2*x^4*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(
sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 4*a*c^8*d*e*x^6/((c^
10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr
t(-c^2*x^2 + 1) + 1)^6) - 3*a*c^8*d^2*x^4/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 3*b
*c^7*d^2*x^3*log(abs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c
^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^7*d^2*x
^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 2/9*b*c^7*e^2*
x^7/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^7) - 2*b*c^7*d*e*x^5/((c^10*x^7/(sqrt(-c^2*x^2
 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*
x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^

```
5) + 8*b*c^6*d*e*x^4*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*
c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 2*b*c^6*d^2*
x^2*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2
*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + 8*a*c^6*d*e*x^4/((c^10*x^7/(s
qrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1)^4) - 2*a*c^6*d^2*x^2/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*
c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^5*d^2*x*
log(abs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(
-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^5*d^2*x*log(sqrt(-c^2*x^
2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2
 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 2/3*b*c^5*e^2*x^5/((c^10*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^5) + 2*b*c^5*d*e*x^3/((c^10*x^7/(sqrt(-...
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\begin{cases} \frac{a\,\left(-3\,d^2+6\,d\,e\,x^2+e^2\,x^4\right)}{3\,x}+b\,e^2\,\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}\left(c\,x\right)}{3}\right)-b\,c\,d^2\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^2}}\right)-\frac{b\,d^2\,\mathrm{asin}\left(c\,x\right)}{x}+\frac{2\,b\,d\,e\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}\left(c\,x\right)\right)}{c} & \text{ if } 0<c\\ \int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^2}{x^2} \,d x & \text{ if } \neg 0<c \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^2,x)
```

```
[Out] piecewise(0 < c, (a*(- 3*d^2 + e^2*x^4 + 6*d*e*x^2))/(3*x) + b*e^2*(((1/c^2
 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x))/3) - b*c*d^2*atanh(1/(- c^
2*x^2 + 1)^(1/2)) - (b*d^2*asin(c*x))/x + (2*b*d*e*((- c^2*x^2 + 1)^(1/2) +
 c*x*asin(c*x)))/c, ~0 < c, int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^2, x))
```

3.612 $\int \frac{(d+ex^2)^2(a+b\text{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=185

$$-\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\text{ArcSin}(cx)}{4c^2}-ibde\text{ArcSin}(cx)^2-\frac{d^2(a+b\text{ArcSin}(cx))}{2x^2}+\frac{1}{2}e^2x^2(a+bA$$

```
[Out] -1/4*b*e^2*arcsin(c*x)/c^2-I*b*d*e*arcsin(c*x)^2-1/2*d^2*(a+b*arcsin(c*x))/
x^2+1/2*e^2*x^2*(a+b*arcsin(c*x))+2*b*d*e*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)-2*b*d*e*arcsin(c*x)*ln(x)+2*d*e*(a+b*arcsin(c*x))*ln(x)-I*b*d
*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d^2*(-c^2*x^2+1)^(1/2)/x
+1/4*b*e^2*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.25, antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 14, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {272, 45, 4815, 12, 6874, 270, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$-\frac{d^2(a+b\text{ArcSin}(cx))}{2x^2}+2de\log(x)(a+b\text{ArcSin}(cx))+\frac{1}{2}e^2x^2(a+b\text{ArcSin}(cx))-\frac{be^2\text{ArcSin}(cx)}{4c^2}-ibde\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-ibde\text{ArcSin}(cx)^2+2bde\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-2bde\log(x)\text{ArcSin}(cx)-\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d^2*Sqrt[1 - c^2*x^2])/x + (b*e^2*x*Sqrt[1 - c^2*x^2])/(4*c) - (b
*e^2*ArcSin[c*x])/(4*c^2) - I*b*d*e*ArcSin[c*x]^2 - (d^2*(a + b*ArcSin[c*x]
))/(2*x^2) + (e^2*x^2*(a + b*ArcSin[c*x]))/2 + 2*b*d*e*ArcSin[c*x]*Log[1 -
E^((2*I)*ArcSin[c*x])] - 2*b*d*e*ArcSin[c*x]*Log[x] + 2*d*e*(a + b*ArcSin[c
*x])*Log[x] - I*b*d*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && NegQ[b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{(d+ex^2)^2(a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d^2(a+b\sin^{-1}(cx))}{2x^2}+\frac{1}{2}e^2x^2\big(a+b\sin^{-1}(cx)\big)+2de\big(a+b\sin^{-1}(cx)\big)\,\mathrm{l}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{2x^2}+\frac{1}{2}e^2x^2\big(a+b\sin^{-1}(cx)\big)+2de\big(a+b\sin^{-1}(cx)\big)\,\mathrm{l}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{2x^2}+\frac{1}{2}e^2x^2\big(a+b\sin^{-1}(cx)\big)+2de\big(a+b\sin^{-1}(cx)\big)\,\mathrm{l}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{2x^2}+\frac{1}{2}e^2x^2\big(a+b\sin^{-1}(cx)\big)+2de\big(a+b\sin^{-1}(cx)\big)\,\mathrm{l}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{d^2(a+b\sin^{-1}(cx))}{2x^2}+\frac{1}{2}e^2x^2(a$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-\frac{d^2(a+b\sin^{-1}(c}{2x^2}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\sin^{-1}(cx)}{4c^2}-ibde\sin^{-1}(cx)^2$$

Mathematica [A]
time = 0.26, size = 184, normalized size = 0.99

$$\frac{1}{2}\left(-\frac{ad^2}{x^2}+ae^2x^2-\frac{bcd^2\sqrt{1-c^2x^2}}{x}+\frac{be^2x\sqrt{1-c^2x^2}}{2c}-2ibde\text{ArcSin}(cx)^2+\frac{be^2\text{ArcTan}\left(\frac{cx}{1-\sqrt{1-c^2x^2}}\right)}{c^2}+b\text{ArcSin}(cx)\left(-\frac{d^2}{x^2}+e^2x^2+4de\log\left(1-e^{2i\text{ArcSin}(cx)}\right)\right)+4ade\log(x)-2ibde\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (-((a*d^2)/x^2) + a*e^2*x^2 - (b*c*d^2*Sqrt[1 - c^2*x^2])/x + (b*e^2*x*Sqrt
[1 - c^2*x^2])/(2*c) - (2*I)*b*d*e*ArcSin[c*x]^2 + (b*e^2*ArcTan[(c*x)/(1 -
 Sqrt[1 - c^2*x^2])])/c^2 + b*ArcSin[c*x]*(-(d^2/x^2) + e^2*x^2 + 4*d*e*Log
[1 - E^((2*I)*ArcSin[c*x])]) + 4*a*d*e*Log[x] - (2*I)*b*d*e*PolyLog[2, E^((
2*I)*ArcSin[c*x])])/2
```

Maple [A]
time = 0.80, size = 281, normalized size = 1.52

method	result
derivativedivides	$c^2\left(\frac{a\,x^2e^2}{2c^2}-\frac{a\,d^2}{2c^2x^2}+\frac{2ade\ln(cx)}{c^2}-\frac{ib\arcsin(cx)^2de}{c^2}+\frac{b\,e^2x\sqrt{-c^2x^2+1}}{4c^3}+\frac{b\arcsin(cx)x^2e^2}{2c^2}-\frac{b\,e^2\,\mathrm{arc}}{4}\right.$
default	$c^2\left(\frac{a\,x^2e^2}{2c^2}-\frac{a\,d^2}{2c^2x^2}+\frac{2ade\ln(cx)}{c^2}-\frac{ib\arcsin(cx)^2de}{c^2}+\frac{b\,e^2x\sqrt{-c^2x^2+1}}{4c^3}+\frac{b\arcsin(cx)x^2e^2}{2c^2}-\frac{b\,e^2\,\mathrm{arc}}{4}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(1/2*a/c^2*x^2*e^2-1/2*a*d^2/c^2/x^2+2*a/c^2*d*e*ln(c*x)-I*b/c^2*arcsin
(c*x)^2*d*e+1/4*b*e^2*x*(-c^2*x^2+1)^(1/2)/c^3+1/2*b/c^2*arcsin(c*x)*x^2*e^
2-1/4*b*e^2*arcsin(c*x)/c^4+1/2*I*d^2*b-1/2*b*d^2/c/x*(-c^2*x^2+1)^(1/2)-1/
2*b*arcsin(c*x)*d^2/c^2/x^2+2*b/c^2*d*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))+2*b/c^2*d*e*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b/c^2*d*
e*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b/c^2*d*e*polylog(2,I*c*x+(-c^2*
x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*b*d^2*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) + 1/2*a*x^2*e^2 + 2*a
*d*e*log(x) - 1/2*a*d^2/x^2 + integrate((b*x^2*e^2 + 2*b*d*e)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*x^4*e^2 + 2*a*d*x^2*e + a*d^2 + (b*x^4*e^2 + 2*b*d*x^2*e + b*d^
2)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\operatorname{asin}(cx))\left(d+ex^2\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**2/x**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))\,\left(e\,x^2 + d\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^3, x)
```

3.613 $\int \frac{(d+ex^2)^2(a+b\text{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=126

$$\frac{be^2\sqrt{1-c^2x^2}}{c}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2(a+b\text{ArcSin}(cx))}{3x^3}-\frac{2de(a+b\text{ArcSin}(cx))}{x}+e^2x(a+b\text{ArcSin}(cx))-\frac{1}{6}bc$$

```
[Out] -1/3*d^2*(a+b*arcsin(c*x))/x^3-2*d*e*(a+b*arcsin(c*x))/x+e^2*x*(a+b*arcsin(
c*x))-1/6*b*c*d*(c^2*d+12*e)*arctanh((-c^2*x^2+1)^(1/2))+b*e^2*(-c^2*x^2+1)
^(1/2)/c-1/6*b*c*d^2*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.15, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {276, 4815, 1265, 911, 1171, 396, 214}

$$-\frac{d^2(a+b\text{ArcSin}(cx))}{3x^3}-\frac{2de(a+b\text{ArcSin}(cx))}{x}+e^2x(a+b\text{ArcSin}(cx))-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{1}{6}bcd(c^2d+12e)\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be^2\sqrt{1-c^2x^2}}{c}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*e^2*Sqrt[1 - c^2*x^2])/c - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) - (2*d*e*(a + b*ArcSin[c*x]))/x + e^2*x*(a + b*A
rcSin[c*x]) - (b*c*d*(c^2*d + 12*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
```

```
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1171

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, Simp[(-R)*x*((d + e*x^2)^(q + 1)/(2*d*(q + 1))), x] + Dist[1/(2*d*(q
 + 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x
], x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2
 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)^2\,(a+b\sin^{-1}(cx))}{x^4}\,dx = -\frac{d^2(a+b\sin^{-1}(cx))}{3x^3} - \frac{2de(a+b\sin^{-1}(cx))}{x} + e^2x\big(a+b\sin^{-1}(cx)\big) -$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{3x^3} - \frac{2de(a+b\sin^{-1}(cx))}{x} + e^2x\big(a+b\sin^{-1}(cx)\big) -$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{3x^3} - \frac{2de(a+b\sin^{-1}(cx))}{x} + e^2x\big(a+b\sin^{-1}(cx)\big) +$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\sin^{-1}(cx))}{3x^3} - \frac{2de(a+b\sin^{-1}(cx))}{x} + e^2x$$

$$= \frac{be^2\sqrt{1-c^2x^2}}{c} - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\sin^{-1}(cx))}{3x^3} - \frac{2de(a+b\,\mathrm{s}}{x}$$

$$= \frac{be^2\sqrt{1-c^2x^2}}{c} - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\sin^{-1}(cx))}{3x^3} - \frac{2de(a+b\,\mathrm{s}}{x}$$

Mathematica [A]
time = 0.13, size = 140, normalized size = 1.11

$$\frac{1}{6}\left(-\frac{2ad^2}{x^3} - \frac{12ade}{x} + 6ae^2x + 6b\left(\frac{e^2}{c} - \frac{cd^2}{6x^2}\right)\sqrt{1-c^2x^2} - \frac{2b(d^2+6dex^2-3e^2x^4)\,\mathrm{ArcSin}(cx)}{x^3} + bcd(c^2d+12e)\log(x) - bcd(c^2d+12e)\log\left(1+\sqrt{1-c^2x^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^2)/x^3 - (12*a*d*e)/x + 6*a*e^2*x + 6*b*(e^2/c - (c*d^2)/(6*x^2))*
Sqrt[1 - c^2*x^2] - (2*b*(d^2 + 6*d*e*x^2 - 3*e^2*x^4)*ArcSin[c*x])/x^3 + b
*c*d*(c^2*d + 12*e)*Log[x] - b*c*d*(c^2*d + 12*e)*Log[1 + Sqrt[1 - c^2*x^2]
])/6
```

Maple [A]
time = 0.10, size = 156, normalized size = 1.24

method	result

derivativedivides	$c^3 \left(\frac{a\left(e^2cx - \frac{c\,d^2}{3x^3} - \frac{2cde}{x}\right)}{c^4} + \frac{b\left(\arcsin(cx)e^2cx - \frac{\arcsin(cx)c\,d^2}{3x^3} - \frac{2\arcsin(cx)cde}{x} + e^2\sqrt{-c^2x^2+1} + \frac{c^4d^2\left(-\frac{\sqrt{-c^2}}{2c^2}\right.}{}\right.}{c^4}\right.$
default	$c^3 \left(\frac{a\left(e^2cx - \frac{c\,d^2}{3x^3} - \frac{2cde}{x}\right)}{c^4} + \frac{b\left(\arcsin(cx)e^2cx - \frac{\arcsin(cx)c\,d^2}{3x^3} - \frac{2\arcsin(cx)cde}{x} + e^2\sqrt{-c^2x^2+1} + \frac{c^4d^2\left(-\frac{\sqrt{-c^2}}{2c^2}\right.}{}\right.}{c^4}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(a/c^4*(e^2*c*x-1/3*c*d^2/x^3-2*c*d*e/x)+b/c^4*(arcsin(c*x)*e^2*c*x-1/3
*arcsin(c*x)*c*d^2/x^3-2*arcsin(c*x)*c*d*e/x+e^2*(-c^2*x^2+1)^(1/2)+1/3*c^4
*d^2*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*arctanh(1/(-c^2*x^2+1)^(1/2)))-2*
c^2*d*e*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]

time = 0.51, size = 159, normalized size = 1.26

$$-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd^2-2\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bde+axe^2+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)be^2}{c}-\frac{2ade}{x}-\frac{ad^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)
/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^2 - 2*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) +
 2/abs(x)) + arcsin(c*x)/x)*b*d*e + a*x*e^2 + (c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*b*e^2/c - 2*a*d*e/x - 1/3*a*d^2/x^3
```

Fricas [A]
time = 3.08, size = 181, normalized size = 1.44

$$\frac{12\,acx^4e^2 - 24\,acdx^2e - 4\,acd^2 + 4\left(3\,bcx^4e^2 - 6\,bcdx^2e - bcd^2\right)\arcsin\left(cx\right) - \left(bc^4d^2x^3 + 12\,bc^2dx^3e\right)\log\left(\sqrt{-c^2x^2+1}+1\right) + \left(bc^4d^2x^3 + 12\,bc^2dx^3e\right)\log\left(\sqrt{-c^2x^2+1}-1\right) - 2\left(bc^2d^2x - 6\,bx^3e^2\right)\sqrt{-c^2x^2+1}}{12\,cx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(12*a*c*x^4*e^2 - 24*a*c*d*x^2*e - 4*a*c*d^2 + 4*(3*b*c*x^4*e^2 - 6*b*
c*d*x^2*e - b*c*d^2)*arcsin(c*x) - (b*c^4*d^2*x^3 + 12*b*c^2*d*x^3*e)*log(s
qrt(-c^2*x^2 + 1) + 1) + (b*c^4*d^2*x^3 + 12*b*c^2*d*x^3*e)*log(sqrt(-c^2*x
^2 + 1) - 1) - 2*(b*c^2*d^2*x - 6*b*x^3*e^2)*sqrt(-c^2*x^2 + 1))/(c*x^3)
```

Sympy [A]
time = 4.20, size = 218, normalized size = 1.73

$$-\frac{ad^2}{3x^3} - \frac{2ade}{x} + ae^2x + \frac{bcd^2\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} + \frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}} - \frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for}\ \frac{1}{|c^2x^2|}>1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise} \end{cases}\right)}{3} + 2bcde\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|}>1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bd^2\operatorname{asin}(cx)}{3x^3} - \frac{2bde\operatorname{asin}(cx)}{x} + be^2\left(\begin{cases} 0 & \text{for}\ c=0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) - 2*a*d*e/x + a*e**2*x + b*c*d**2*Piecewise((-c**2*acosh(1
/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**3*sqrt(-1 + 1/(c**
2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c*sqrt(1 - 1/
(c**2*x**2))/(2*x), True))/3 + 2*b*c*d*e*Piecewise((-acosh(1/(c*x)), 1/Abs(
c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*d**2*asin(c*x)/(3*x**3) - 2*b
*d*e*asin(c*x)/x + b*e**2*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**
2*x**2 + 1)/c, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2534 vs. $2(114) = 228$.
time = 1.56, size = 2534, normalized size = 20.11

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^12*d^2*x^8*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/24*a*c^12*
d^2*x^8/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) + 1/24*b*c^11*d^2*x^7/((c^6*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
1) + 1)^7) - 1/6*b*c^10*d^2*x^6*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 1
/6*a*c^10*d^2*x^6/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) + 1/6*b*c^9*d^2*x^5*log(abs(c
)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1
) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/6*b*c^9*d^2*x^5*log(sqrt(-c^2*x^2
 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 1/24*b*c^9*d^2*x^5/((c^6*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
+ 1) + 1)^5) - b*c^8*d*e*x^6*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)
^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 1/4*
b*c^8*d^2*x^4*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - a*c^8*d*e*x^6/((c^6
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt
(-c^2*x^2 + 1) + 1)^6) - 1/4*a*c^8*d^2*x^4/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) + 2*
b*c^7*d*e*x^5*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 1/6*b*c^7*d^
2*x^3*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 2*b*c^7*d*e*x^5*log(
sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqr
t(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/6*b*c^7*d^2*x^3*log
(sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 1/24*b*c^7*d^2*x^3/(
(c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(
sqrt(-c^2*x^2 + 1) + 1)^3) - 2*b*c^6*d*e*x^4*arcsin(c*x)/((c^6*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1
) + 1)^4) - 1/6*b*c^6*d^2*x^2*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1
)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) - 2*a
*c^6*d*e*x^4/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/6*a*c^6*d^2*x^2/((c^6*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^2) + 2*b*c^5*d*e*x^3*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2
 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)
^3) - 2*b*c^5*d*e*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2
+ 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^
3) - b*c^5*e^2*x^5/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/24*b*c^5*d^2*x/((c^6*x^5
/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^
2*x^2 + 1) + 1)) - 1/24*b*c^4*d^2*arcsin(c*x)/(c^6*x^5/(sqrt(-c^2*x^2 + 1)
```

```
+ 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3) + 2*b*c^4*e^2*x^4*arcsin(c*x)/
((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*
(sqrt(-c^2*x^2 + 1) + 1)^4) - b*c^4*d*e*x^2*arcsin(c*x)/((c^6*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1)
 + 1)^2) - 1/24*a*c^4*d^2/(c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3) + 2*a*c^4*e^2*x^4/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - a*
c^4*d*e*x^2/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^3*e^2*x^3/((c^6*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1)
 + 1)^3)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^4,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^4, x)
```

3.614 $\int x^4 (d+ex^2)^3 (a+b\text{ArcSin}(cx))\,dx$

Optimal. Leaf size=341

$$\frac{b(231c^6d^3+495c^4d^2e+385c^2de^2+105e^3)\sqrt{1-c^2x^2}}{1155c^{11}}-\frac{b(462c^6d^3+1485c^4d^2e+1540c^2de^2+525e^3)(1-c^2$$

```
[Out] -1/3465*b*(462*c^6*d^3+1485*c^4*d^2*e+1540*c^2*d*e^2+525*e^3)*(-c^2*x^2+1)^
(3/2)/c^11+1/1925*b*(77*c^6*d^3+495*c^4*d^2*e+770*c^2*d*e^2+350*e^3)*(-c^2*
x^2+1)^(5/2)/c^11-1/1617*b*e*(99*c^4*d^2+308*c^2*d*e+210*e^2)*(-c^2*x^2+1)^
(7/2)/c^11+1/297*b*e^2*(11*c^2*d+15*e)*(-c^2*x^2+1)^(9/2)/c^11-1/121*b*e^3*
(-c^2*x^2+1)^(11/2)/c^11+1/5*d^3*x^5*(a+b*arcsin(c*x))+3/7*d^2*e*x^7*(a+b*a
rcsin(c*x))+1/3*d*e^2*x^9*(a+b*arcsin(c*x))+1/11*e^3*x^11*(a+b*arcsin(c*x))
+1/1155*b*(231*c^6*d^3+495*c^4*d^2*e+385*c^2*d*e^2+105*e^3)*(-c^2*x^2+1)^(1
/2)/c^11
```

Rubi [A]
time = 0.31, antiderivative size = 341, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {276, 4815, 12, 1813, 1634}

$$\frac{1}{5}d^3x^5(a+b\text{ArcSin}(cx))+\frac{3}{7}d^2ex^7(a+b\text{ArcSin}(cx))+\frac{1}{3}de^2x^9(a+b\text{ArcSin}(cx))+\frac{1}{11}e^3x^{11}(a+b\text{ArcSin}(cx))+\frac{be^2(1-c^2x^2)^{9/2}(11c^2d+15e)}{297c^{11}}-\frac{be^3(1-c^2x^2)^{11/2}}{121c^{11}}-\frac{be(1-c^2x^2)^{7/2}(99c^4d^2+308c^2de+210e^2)}{1617c^{11}}+\frac{b(1-c^2x^2)^{5/2}(77c^6d^3+495c^4d^2e+770c^2de^2+350e^3)}{1925c^{11}}-\frac{b(1-c^2x^2)^{3/2}(462c^6d^3+1485c^4d^2e+1540c^2de^2+525e^3)}{3465c^{11}}+\frac{b\sqrt{1-c^2x^2}(231c^6d^3+495c^4d^2e+385c^2de^2+105e^3)}{1155c^{11}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(231*c^6*d^3 + 495*c^4*d^2*e + 385*c^2*d*e^2 + 105*e^3)*Sqrt[1 - c^2*x^2
])/(1155*c^11) - (b*(462*c^6*d^3 + 1485*c^4*d^2*e + 1540*c^2*d*e^2 + 525*e^
3)*(1 - c^2*x^2)^(3/2))/(3465*c^11) + (b*(77*c^6*d^3 + 495*c^4*d^2*e + 770*
c^2*d*e^2 + 350*e^3)*(1 - c^2*x^2)^(5/2))/(1925*c^11) - (b*e*(99*c^4*d^2 +
308*c^2*d*e + 210*e^2)*(1 - c^2*x^2)^(7/2))/(1617*c^11) + (b*e^2*(11*c^2*d
+ 15*e)*(1 - c^2*x^2)^(9/2))/(297*c^11) - (b*e^3*(1 - c^2*x^2)^(11/2))/(121
*c^11) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*d^2*e*x^7*(a + b*ArcSin[c*x])
)/7 + (d*e^2*x^9*(a + b*ArcSin[c*x]))/3 + (e^3*x^11*(a + b*ArcSin[c*x]))/11
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^4\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\right.$$

$$=\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\right.$$

$$=\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\right.$$

$$=\frac{1}{5}d^3x^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}d^2ex^7\left(a+b\sin^{-1}(cx)\right)+\frac{1}{3}de^2x^9\left(a+b\right.$$

$$=\frac{b(231c^6d^3+495c^4d^2e+385c^2de^2+105e^3)\sqrt{1-c^2x^2}}{1155c^{11}}-\frac{b(462c^6d^3}{}$$

Mathematica [A]
time = 0.20, size = 271, normalized size = 0.79

$$\frac{3465ax^5(231d^3+495d^2ex^2+385de^2x^4+105e^3x^6)+\frac{b\sqrt{1-c^2x^2}\,(134400e^3+4480c^2e^2(121d+15ex^2)+80c^4e(9801d^2+3388dex^2+630e^2x^4)+24c^6(17787d^3+16335d^2ex^2+8470de^2x^4+1750e^3x^6)+c^{10}x^4(160083d^3+245025d^2ex^2+148225de^2x^4+33075e^3x^6)+2c^8(106722d^3x^2+147015d^2ex^4+84700de^2x^6+18375e^3x^8))}{c^{11}}+3465bx^5(231d^3+495d^2ex^2+385de^2x^4+105e^3x^6)\,\mathrm{ArcSin}(cx)}{4002075}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3465*a*x^5*(231*d^3 + 495*d^2*e*x^2 + 385*d*e^2*x^4 + 105*e^3*x^6) + (b*Sq
rt[1 - c^2*x^2]*(134400*e^3 + 4480*c^2*e^2*(121*d + 15*e*x^2) + 80*c^4*e*(9
801*d^2 + 3388*d*e*x^2 + 630*e^2*x^4) + 24*c^6*(17787*d^3 + 16335*d^2*e*x^2
 + 8470*d*e^2*x^4 + 1750*e^3*x^6) + c^10*x^4*(160083*d^3 + 245025*d^2*e*x^2
 + 148225*d*e^2*x^4 + 33075*e^3*x^6) + 2*c^8*(106722*d^3*x^2 + 147015*d^2*e
*x^4 + 84700*d*e^2*x^6 + 18375*e^3*x^8)))/c^11 + 3465*b*x^5*(231*d^3 + 495*
d^2*e*x^2 + 385*d*e^2*x^4 + 105*e^3*x^6)*ArcSin[c*x])/4002075
```

Maple [A]

time = 0.14, size = 497, normalized size = 1.46

method	result
derivativedivides	$\frac{a\left(\frac{1}{5}d^3c^{11}x^5+\frac{3}{7}d^2c^{11}e\,x^7+\frac{1}{3}d\,c^{11}e^2x^9+\frac{1}{11}e^3c^{11}x^{11}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{11}x^5}{5}+\frac{3\arcsin(cx)d^2c^{11}e\,x^7}{7}+\frac{\arcsin(cx)d\,c^{11}e^2x^9}{3}+\mathrm{arcsin}\right.}{}$
default	$\frac{a\left(\frac{1}{5}d^3c^{11}x^5+\frac{3}{7}d^2c^{11}e\,x^7+\frac{1}{3}d\,c^{11}e^2x^9+\frac{1}{11}e^3c^{11}x^{11}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{11}x^5}{5}+\frac{3\arcsin(cx)d^2c^{11}e\,x^7}{7}+\frac{\arcsin(cx)d\,c^{11}e^2x^9}{3}+\mathrm{arcsin}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(a/c^6*(1/5*d^3*c^11*x^5+3/7*d^2*c^11*e*x^7+1/3*d*c^11*e^2*x^9+1/11*e
^3*c^11*x^11)+b/c^6*(1/5*arcsin(c*x)*d^3*c^11*x^5+3/7*arcsin(c*x)*d^2*c^11*
e*x^7+1/3*arcsin(c*x)*d*c^11*e^2*x^9+1/11*arcsin(c*x)*e^3*c^11*x^11-1/5*d^3
*c^6*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*
(-c^2*x^2+1)^(1/2))-3/7*d^2*c^4*e*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4
*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^
(1/2))-1/3*d*c^2*e^2*(-1/9*c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^
2+1)^(1/2)-16/105*c^4*x^4*(-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1
/2)-128/315*(-c^2*x^2+1)^(1/2))-1/11*e^3*(-1/11*c^10*x^10*(-c^2*x^2+1)^(1/2
)-10/99*c^8*x^8*(-c^2*x^2+1)^(1/2)-80/693*c^6*x^6*(-c^2*x^2+1)^(1/2)-32/231
*c^4*x^4*(-c^2*x^2+1)^(1/2)-128/693*c^2*x^2*(-c^2*x^2+1)^(1/2)-256/693*(-c^
2*x^2+1)^(1/2))))
```

Maxima [A]

time = 0.49, size = 463, normalized size = 1.36

$$\frac{1}{11}ax^{11}e^3+\frac{1}{3}adx^9e^2+\frac{3}{7}ad^2x^7e+\frac{1}{5}ad^3x^5+\frac{1}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^3+\frac{3}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bd^2e+\frac{1}{945}\left(315x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}\,x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}\,x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}\,x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}\,x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right)bde^2+\frac{1}{7623}\left(693x^{11}\arcsin(cx)+\left(\frac{63\sqrt{-c^2x^2+1}\,x^{10}}{c^2}+\frac{70\sqrt{-c^2x^2+1}\,x^8}{c^4}+\frac{80\sqrt{-c^2x^2+1}\,x^6}{c^6}+\frac{96\sqrt{-c^2x^2+1}\,x^4}{c^8}+\frac{128\sqrt{-c^2x^2+1}\,x^2}{c^{10}}+\frac{256\sqrt{-c^2x^2+1}}{c^{12}}\right)c\right)be^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/11*a*x^11*e^3 + 1/3*a*d*x^9*e^2 + 3/7*a*d^2*x^7*e + 1/5*a*d^3*x^5 + 1/75*
(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*
x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^3 + 3/245*(35*x^7*arcsin(c*x) +
(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*
x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d^2*e + 1/945*(315*x^9*a
rcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4
 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt
(-c^2*x^2 + 1)/c^10)*c)*b*d*e^2 + 1/7623*(693*x^11*arcsin(c*x) + (63*sqrt(-
c^2*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 +
1)*x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^1
0 + 256*sqrt(-c^2*x^2 + 1)/c^12)*c)*b*e^3
```

Fricas [A]
time = 2.72, size = 313, normalized size = 0.92

$$\frac{363825\,ac^{11}x^{11}e^3 + 1334025\,ac^{11}dx^9e^2 + 1715175\,ac^{11}d^2x^7e + 800415\,ac^{11}d^3x^5 + 3465\,(105\,bc^{11}x^{11}e^3 + 385\,bc^{11}dx^9e^2 + 495\,bc^{11}d^2x^7e + 231\,bc^{11}d^3x^5)\arcsin(cx) + (160083\,bc^{10}d^3x^4 + 213444\,bc^8d^3x^2 + 426888\,bc^6d^3 + 525\,(63\,bc^{10}x^{10} + 70\,bc^8x^8 + 80\,bc^6x^6 + 96\,bc^4x^4 + 128\,bc^2x^2 + 256\,b)e^3 + 4235\,(35\,bc^{10}dx^8 + 40\,bc^8dx^6 + 48\,bc^6dx^4 + 64\,bc^4dx^2 + 128\,bc^2d)e^2 + 49005\,(5\,bc^{10}d^2x^6 + 6\,bc^8d^2x^4 + 8\,bc^6d^2x^2 + 16\,bc^4d^2)e)\sqrt{-c^2x^2+1}}{4002075\,c^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/4002075*(363825*a*c^11*x^11*e^3 + 1334025*a*c^11*d*x^9*e^2 + 1715175*a*c^
11*d^2*x^7*e + 800415*a*c^11*d^3*x^5 + 3465*(105*b*c^11*x^11*e^3 + 385*b*c^
11*d*x^9*e^2 + 495*b*c^11*d^2*x^7*e + 231*b*c^11*d^3*x^5)*arcsin(c*x) + (16
0083*b*c^10*d^3*x^4 + 213444*b*c^8*d^3*x^2 + 426888*b*c^6*d^3 + 525*(63*b*c
^10*x^10 + 70*b*c^8*x^8 + 80*b*c^6*x^6 + 96*b*c^4*x^4 + 128*b*c^2*x^2 + 256
*b)*e^3 + 4235*(35*b*c^10*d*x^8 + 40*b*c^8*d*x^6 + 48*b*c^6*d*x^4 + 64*b*c^
4*d*x^2 + 128*b*c^2*d)*e^2 + 49005*(5*b*c^10*d^2*x^6 + 6*b*c^8*d^2*x^4 + 8*
b*c^6*d^2*x^2 + 16*b*c^4*d^2)*e)*sqrt(-c^2*x^2 + 1))/c^11
```

Sympy [A]
time = 3.76, size = 631, normalized size = 1.85

$$\begin{cases} \frac{ad^3x^5}{5} + \frac{3ad^2ex^7}{7} + \frac{ade^2x^9}{3} + \frac{ae^3x^{11}}{11} + \frac{bd^3x^5\operatorname{asin}(cx)}{5} + \frac{3bd^2ex^7\operatorname{asin}(cx)}{7} + \frac{bde^2x^9\operatorname{asin}(cx)}{3} + \frac{be^3x^{11}\operatorname{asin}(cx)}{11} + \frac{bd^3x^4\sqrt{-c^2x^2+1}}{25c} + \frac{3bd^2ex^6\sqrt{-c^2x^2+1}}{49c} + \frac{bde^2x^8\sqrt{-c^2x^2+1}}{27c} + \frac{be^3x^{10}\sqrt{-c^2x^2+1}}{121c} + \frac{4bd^3x^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{18bd^2ex^4\sqrt{-c^2x^2+1}}{245c^3} + \frac{8bde^2x^6\sqrt{-c^2x^2+1}}{189c^3} + \frac{10be^3x^8\sqrt{-c^2x^2+1}}{1089c^3} + \frac{8bd^3\sqrt{-c^2x^2+1}}{75c^5} + \frac{24bd^2ex^2\sqrt{-c^2x^2+1}}{245c^5} + \frac{16bde^2x^4\sqrt{-c^2x^2+1}}{315c^5} + \frac{80be^3x^6\sqrt{-c^2x^2+1}}{7623c^5} + \frac{48bd^2e\sqrt{-c^2x^2+1}}{245c^7} + \frac{64bde^2x^2\sqrt{-c^2x^2+1}}{945c^7} + \frac{32be^3x^4\sqrt{-c^2x^2+1}}{2541c^7} + \frac{128bde^2\sqrt{-c^2x^2+1}}{945c^9} + \frac{128be^3x^2\sqrt{-c^2x^2+1}}{7623c^9} + \frac{256be^3\sqrt{-c^2x^2+1}}{7623c^{11}} & \text{for}\: c \neq 0 \\ a\left(\frac{d^3x^5}{5} + \frac{3d^2ex^7}{7} + \frac{de^2x^9}{3} + \frac{e^3x^{11}}{11}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**5/5 + 3*a*d**2*e*x**7/7 + a*d*e**2*x**9/3 + a*e**3*x**
11/11 + b*d**3*x**5*asin(c*x)/5 + 3*b*d**2*e*x**7*asin(c*x)/7 + b*d*e**2*x*
*9*asin(c*x)/3 + b*e**3*x**11*asin(c*x)/11 + b*d**3*x**4*sqrt(-c**2*x**2 +
1)/(25*c) + 3*b*d**2*e*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b*d*e**2*x**8*sqr
t(-c**2*x**2 + 1)/(27*c) + b*e**3*x**10*sqrt(-c**2*x**2 + 1)/(121*c) + 4*b*
d**3*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 18*b*d**2*e*x**4*sqrt(-c**2*x**2
 + 1)/(245*c**3) + 8*b*d*e**2*x**6*sqrt(-c**2*x**2 + 1)/(189*c**3) + 10*b*e
```

```
**3*x**8*sqrt(-c**2*x**2 + 1)/(1089*c**3) + 8*b*d**3*sqrt(-c**2*x**2 + 1)/(
75*c**5) + 24*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*d*e**2*x
**4*sqrt(-c**2*x**2 + 1)/(315*c**5) + 80*b*e**3*x**6*sqrt(-c**2*x**2 + 1)/(
7623*c**5) + 48*b*d**2*e*sqrt(-c**2*x**2 + 1)/(245*c**7) + 64*b*d*e**2*x**2
*sqrt(-c**2*x**2 + 1)/(945*c**7) + 32*b*e**3*x**4*sqrt(-c**2*x**2 + 1)/(254
1*c**7) + 128*b*d*e**2*sqrt(-c**2*x**2 + 1)/(945*c**9) + 128*b*e**3*x**2*sq
rt(-c**2*x**2 + 1)/(7623*c**9) + 256*b*e**3*sqrt(-c**2*x**2 + 1)/(7623*c**1
1), Ne(c, 0)), (a*(d**3*x**5/5 + 3*d**2*e*x**7/7 + d*e**2*x**9/3 + e**3*x**
11/11), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 943 vs. 2(309) = 618.
time = 0.43, size = 943, normalized size = 2.77

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/11*a*e^3*x^11 + 1/3*a*d*e^2*x^9 + 3/7*a*d^2*e*x^7 + 1/5*a*d^3*x^5 + 1/5*(
c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*d^3*x*arcsin(c
*x)/c^4 + 3/7*(c^2*x^2 - 1)^3*b*d^2*e*x*arcsin(c*x)/c^6 + 1/5*b*d^3*x*arcsi
n(c*x)/c^4 + 9/7*(c^2*x^2 - 1)^2*b*d^2*e*x*arcsin(c*x)/c^6 + 1/3*(c^2*x^2 -
 1)^4*b*d*e^2*x*arcsin(c*x)/c^8 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b
*d^3/c^5 + 9/7*(c^2*x^2 - 1)*b*d^2*e*x*arcsin(c*x)/c^6 + 4/3*(c^2*x^2 - 1)^
3*b*d*e^2*x*arcsin(c*x)/c^8 + 1/11*(c^2*x^2 - 1)^5*b*e^3*x*arcsin(c*x)/c^10
 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^5 + 3/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2
 + 1)*b*d^2*e/c^7 + 3/7*b*d^2*e*x*arcsin(c*x)/c^6 + 2*(c^2*x^2 - 1)^2*b*d*e
^2*x*arcsin(c*x)/c^8 + 5/11*(c^2*x^2 - 1)^4*b*e^3*x*arcsin(c*x)/c^10 + 1/5*
sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 9/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^
2*e/c^7 + 1/27*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^9 + 4/3*(c^2*x^
2 - 1)*b*d*e^2*x*arcsin(c*x)/c^8 + 10/11*(c^2*x^2 - 1)^3*b*e^3*x*arcsin(c*x
)/c^10 - 3/7*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^7 + 4/21*(c^2*x^2 - 1)^3*sqrt(-
c^2*x^2 + 1)*b*d*e^2/c^9 + 1/121*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b*e^3/c
^11 + 1/3*b*d*e^2*x*arcsin(c*x)/c^8 + 10/11*(c^2*x^2 - 1)^2*b*e^3*x*arcsin(
c*x)/c^10 + 3/7*sqrt(-c^2*x^2 + 1)*b*d^2*e/c^7 + 2/5*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b*d*e^2/c^9 + 5/99*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^3/c^
11 + 5/11*(c^2*x^2 - 1)*b*e^3*x*arcsin(c*x)/c^10 - 4/9*(-c^2*x^2 + 1)^(3/2)
*b*d*e^2/c^9 + 10/77*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3/c^11 + 1/11*b
*e^3*x*arcsin(c*x)/c^10 + 1/3*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^9 + 2/11*(c^2*x^
2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3/c^11 - 5/33*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^
11 + 1/11*sqrt(-c^2*x^2 + 1)*b*e^3/c^11
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^3,x)
[Out] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.615 $\int x^3(d+ex^2)^3(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=380

$$-\frac{b(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4)\,x\sqrt{1-c^2x^2}}{76800c^9e}-\frac{b(136c^6d^3-1096c^4d^2e-1617}{3}$$

```
[Out] 1/5120*b*(128*c^10*d^5-480*c^6*d^3*e^2-800*c^4*d^2*e^3-525*c^2*d*e^4-126*e^
5)*arcsin(c*x)/c^10/e^2-1/8*d*(e*x^2+d)^4*(a+b*arcsin(c*x))/e^2+1/10*(e*x^2
+d)^5*(a+b*arcsin(c*x))/e^2-1/76800*b*(1232*c^8*d^4-2536*c^6*d^3*e-7758*c^4
*d^2*e^2-6615*c^2*d*e^3-1890*e^4)*x*(-c^2*x^2+1)^(1/2)/c^9/e-1/38400*b*(136
*c^6*d^3-1096*c^4*d^2*e-1617*c^2*d*e^2-630*e^3)*x*(e*x^2+d)*(-c^2*x^2+1)^(1
/2)/c^7/e+1/9600*b*(26*c^4*d^2+201*c^2*d*e+126*e^2)*x*(e*x^2+d)^2*(-c^2*x^2
+1)^(1/2)/c^5/e+1/1600*b*(11*c^2*d+18*e)*x*(e*x^2+d)^3*(-c^2*x^2+1)^(1/2)/c
^3/e+1/100*b*x*(e*x^2+d)^4*(-c^2*x^2+1)^(1/2)/c/e
```

Rubi [A]
time = 0.36, antiderivative size = 380, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {272, 45, 4815, 12, 542, 396, 222}

$$\frac{(d+ex^2)^5(a+b\text{ArcSin}(cx))}{10e^2}-\frac{d(d+ex^2)^4(a+b\text{ArcSin}(cx))}{8e^2}+\frac{b\text{ArcSin}(cx)(128c^{10}d^5-480c^6d^3e^2-800c^4d^2e^3-525c^2de^4-126e^5)}{5120c^{10}e^2}+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce}+\frac{bx\sqrt{1-c^2x^2}(11c^2d+18e)(d+ex^2)^3}{1600c^3e}+\frac{bx\sqrt{1-c^2x^2}(26c^4d^2+201c^2de+126e^2)(d+ex^2)^2}{9600c^5e}-\frac{bx\sqrt{1-c^2x^2}(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3)(d+ex^2)}{38400c^7e}-\frac{bx\sqrt{1-c^2x^2}(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4)}{76800c^9e}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/76800*(b*(1232*c^8*d^4 - 2536*c^6*d^3*e - 7758*c^4*d^2*e^2 - 6615*c^2*d*
e^3 - 1890*e^4)*x*Sqrt[1 - c^2*x^2])/(c^9*e) - (b*(136*c^6*d^3 - 1096*c^4*d
^2*e - 1617*c^2*d*e^2 - 630*e^3)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(38400*c^
7*e) + (b*(26*c^4*d^2 + 201*c^2*d*e + 126*e^2)*x*Sqrt[1 - c^2*x^2]*(d + e*x
^2)^2)/(9600*c^5*e) + (b*(11*c^2*d + 18*e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^
3)/(1600*c^3*e) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^4)/(100*c*e) + (b*(128
*c^10*d^5 - 480*c^6*d^3*e^2 - 800*c^4*d^2*e^3 - 525*c^2*d*e^4 - 126*e^5)*Ar
cSin[c*x])/(5120*c^10*e^2) - (d*(d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e^2)
+ ((d + e*x^2)^5*(a + b*ArcSin[c*x]))/(10*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 542

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[f*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^q/(
b*(n*(p + q + 1) + 1))), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right)\,dx = -\frac{d\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10e^2}-(bc)$$

$$= -\frac{d\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\sin^{-1}(cx)\right)}{10e^2}-\frac{(bc)}{}$$

$$= \frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^4}{100ce}-\frac{d\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e^2}+\frac{(d+ex^2)}{}$$

$$= \frac{b(11c^2d+18e)\,x\sqrt{1-c^2x^2}\left(d+ex^2\right)^3}{1600c^3e}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^4}{100ce}-$$

$$= \frac{b(26c^4d^2+201c^2de+126e^2)\,x\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{9600c^5e}+\frac{b(11c^2d+18e}{}$$

$$= -\frac{b(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3)\,x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{38400c^7e}$$

$$= -\frac{b(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4)\,x\sqrt{1}}{76800c^9e}$$

$$= -\frac{b(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4)\,x\sqrt{1}}{76800c^9e}$$

Mathematica [A]
time = 0.17, size = 276, normalized size = 0.73

$$\frac{cx\left(1920ac^9x^3(10d^3+20d^2ex^2+15de^2x^4+4e^3x^6)+b\sqrt{1-c^2x^2}(1890e^3+315c^2e^2(25d+4ex^2)+6c^4e(2000d^2+875dex^2+168e^2x^4)+8c^6(900d^3+1000d^2ex^2+525de^2x^4+108e^3x^6)+16c^8(300d^3x^2+400d^2ex^4+225de^2x^6+48e^3x^8))\right)+15b(-480c^6d^3-800c^4d^2e-525c^2de^2-126e^3+128c^{10}x^4(10d^3+20d^2ex^2+15de^2x^4+4e^3x^6))\,\mathrm{ArcSin}(cx)}{76800c^{10}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(1920*a*c^9*x^3*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6) + b
*Sqrt[1 - c^2*x^2]*(1890*e^3 + 315*c^2*e^2*(25*d + 4*e*x^2) + 6*c^4*e*(2000
*d^2 + 875*d*e*x^2 + 168*e^2*x^4) + 8*c^6*(900*d^3 + 1000*d^2*e*x^2 + 525*d
*e^2*x^4 + 108*e^3*x^6) + 16*c^8*(300*d^3*x^2 + 400*d^2*e*x^4 + 225*d*e^2*x
^6 + 48*e^3*x^8))) + 15*b*(-480*c^6*d^3 - 800*c^4*d^2*e - 525*c^2*d*e^2 - 1
26*e^3 + 128*c^10*x^4*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6))*A
rcSin[c*x])/(76800*c^10)
```

Maple [A]
time = 0.13, size = 449, normalized size = 1.18

method	result
derivativedivides	$\frac{a\left(\frac{1}{4}d^3c^{10}x^4+\frac{1}{2}d^2c^{10}e\,x^6+\frac{3}{8}d\,c^{10}e^2x^8+\frac{1}{10}e^3c^{10}x^{10}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{10}x^4}{4}+\frac{\arcsin(cx)d^2c^{10}e\,x^6}{2}+\frac{3\arcsin(cx)d\,c^{10}e^2x^8}{8}+\mathrm{arc}\right.}{}$
default	$\frac{a\left(\frac{1}{4}d^3c^{10}x^4+\frac{1}{2}d^2c^{10}e\,x^6+\frac{3}{8}d\,c^{10}e^2x^8+\frac{1}{10}e^3c^{10}x^{10}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{10}x^4}{4}+\frac{\arcsin(cx)d^2c^{10}e\,x^6}{2}+\frac{3\arcsin(cx)d\,c^{10}e^2x^8}{8}+\mathrm{arc}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(a/c^6*(1/4*d^3*c^10*x^4+1/2*d^2*c^10*e*x^6+3/8*d*c^10*e^2*x^8+1/10*e
^3*c^10*x^10)+b/c^6*(1/4*arcsin(c*x)*d^3*c^10*x^4+1/2*arcsin(c*x)*d^2*c^10*
e*x^6+3/8*arcsin(c*x)*d*c^10*e^2*x^8+1/10*arcsin(c*x)*e^3*c^10*x^10-1/4*d^3
*c^6*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin
(c*x))-1/2*d^2*c^4*e*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^
2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-3/8*d*c^2*e^2*(-1/
8*c^7*x^7*(-c^2*x^2+1)^(1/2)-7/48*c^5*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^3
*(-c^2*x^2+1)^(1/2)-35/128*c*x*(-c^2*x^2+1)^(1/2)+35/128*arcsin(c*x))-1/10*
e^3*(-1/10*c^9*x^9*(-c^2*x^2+1)^(1/2)-9/80*c^7*x^7*(-c^2*x^2+1)^(1/2)-21/16
0*c^5*x^5*(-c^2*x^2+1)^(1/2)-21/128*c^3*x^3*(-c^2*x^2+1)^(1/2)-63/256*c*x*(
-c^2*x^2+1)^(1/2)+63/256*arcsin(c*x))))
```

Maxima [A]
time = 0.50, size = 423, normalized size = 1.11

$$\frac{1}{10}ax^{10}e^3+\frac{3}{8}adx^8e^2+\frac{1}{2}ad^2x^6e+\frac{1}{4}ad^3x^4+\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}\,x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}\,x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)bd^3+\frac{1}{96}\left(48x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}\,x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}\,x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}\,x}{c^6}-\frac{15\arcsin(cx)}{c^7}\right)c\right)bd^2e+\frac{1}{1024}\left(384x^8\arcsin(cx)+\left(\frac{48\sqrt{-c^2x^2+1}\,x^7}{c^2}+\frac{56\sqrt{-c^2x^2+1}\,x^5}{c^4}+\frac{70\sqrt{-c^2x^2+1}\,x^3}{c^6}+\frac{105\sqrt{-c^2x^2+1}\,x}{c^8}-\frac{105\arcsin(cx)}{c^9}\right)c\right)bde^2+\frac{1}{12800}\left(1280x^{10}\arcsin(cx)+\left(\frac{128\sqrt{-c^2x^2+1}\,x^9}{c^2}+\frac{144\sqrt{-c^2x^2+1}\,x^7}{c^4}+\frac{168\sqrt{-c^2x^2+1}\,x^5}{c^6}+\frac{210\sqrt{-c^2x^2+1}\,x^3}{c^8}+\frac{315\sqrt{-c^2x^2+1}\,x}{c^{10}}-\frac{315\arcsin(cx)}{c^{11}}\right)c\right)be^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/10*a*x^10*e^3 + 3/8*a*d*x^8*e^2 + 1/2*a*d^2*x^6*e + 1/4*a*d^3*x^4 + 1/32*
(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x
/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^3 + 1/96*(48*x^6*arcsin(c*x) + (8*sqrt(-c^
2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*
x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*d^2*e + 1/1024*(384*x^8*arcsin(c*x) + (48*
sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x
^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*
d*e^2 + 1/12800*(1280*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 +
144*sqrt(-c^2*x^2 + 1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(
```

```
-c^2*x^2 + 1)*x^3/c^8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c*x)/c^1
1)*c)*b*e^3
```

Fricas [A]
time = 2.22, size = 312, normalized size = 0.82

$$\frac{7680\,ac^{10}x^{10}e^{3}+28800\,ac^{10}dx^{8}e^{2}+38400\,ac^{10}d^{2}x^{6}e+19200\,ac^{10}d^{3}x^{4}+15\,(1280\,bc^{10}d^{3}x^{4}-480\,bc^{6}d^{3}+2\,(256\,bc^{10}x^{10}-63\,b)e^{3}+15\,(128\,bc^{10}dx^{8}-35\,bc^{2}d)e^{2}+160\,(16\,bc^{10}d^{2}x^{6}-5\,bc^{4}d^{2})e)\arcsin(cx)+(4800\,bc^{9}d^{3}x^{3}+7200\,bc^{7}d^{3}x+6\,(128\,bc^{9}x^{9}+144\,bc^{7}x^{7}+168\,bc^{5}x^{5}+210\,bc^{3}x^{3}+315\,bcx)e^{3}+75\,(48\,bc^{9}dx^{7}+56\,bc^{7}dx^{5}+70\,bc^{5}dx^{3}+105\,bc^{3}dx)e^{2}+800\,(8\,bc^{9}d^{2}x^{5}+10\,bc^{7}d^{2}x^{3}+15\,bc^{5}d^{2}x)e)\sqrt{-c^{2}x^{2}+1}}{76800\,c^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/76800*(7680*a*c^10*x^10*e^3 + 28800*a*c^10*d*x^8*e^2 + 38400*a*c^10*d^2*x
^6*e + 19200*a*c^10*d^3*x^4 + 15*(1280*b*c^10*d^3*x^4 - 480*b*c^6*d^3 + 2*(
256*b*c^10*x^10 - 63*b)*e^3 + 15*(128*b*c^10*d*x^8 - 35*b*c^2*d)*e^2 + 160*
(16*b*c^10*d^2*x^6 - 5*b*c^4*d^2)*e)*arcsin(c*x) + (4800*b*c^9*d^3*x^3 + 72
00*b*c^7*d^3*x + 6*(128*b*c^9*x^9 + 144*b*c^7*x^7 + 168*b*c^5*x^5 + 210*b*c
^3*x^3 + 315*b*c*x)*e^3 + 75*(48*b*c^9*d*x^7 + 56*b*c^7*d*x^5 + 70*b*c^5*d*
x^3 + 105*b*c^3*d*x)*e^2 + 800*(8*b*c^9*d^2*x^5 + 10*b*c^7*d^2*x^3 + 15*b*c
^5*d^2*x)*e)*sqrt(-c^2*x^2 + 1))/c^10
```

Sympy [A]
time = 2.73, size = 597, normalized size = 1.57

$$\begin{cases} \frac{ad^{3}x^{4}}{4}+\frac{ad^{2}ex^{6}}{2}+\frac{3ade^{2}x^{8}}{8}+\frac{ae^{3}x^{10}}{10}+\frac{bd^{3}x^{4}\operatorname{asin}(cx)}{4}+\frac{bd^{2}ex^{6}\operatorname{asin}(cx)}{2}+\frac{3bde^{2}x^{8}\operatorname{asin}(cx)}{8}+\frac{be^{3}x^{10}\operatorname{asin}(cx)}{10}+\frac{bd^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{16c}+\frac{bd^{2}ex^{5}\sqrt{-c^{2}x^{2}+1}}{12c}+\frac{3bde^{2}x^{7}\sqrt{-c^{2}x^{2}+1}}{64c}+\frac{be^{3}x^{9}\sqrt{-c^{2}x^{2}+1}}{100c}+\frac{3bd^{3}x\sqrt{-c^{2}x^{2}+1}}{32c^{3}}+\frac{5bd^{2}ex^{3}\sqrt{-c^{2}x^{2}+1}}{48c^{3}}+\frac{7bde^{2}x^{5}\sqrt{-c^{2}x^{2}+1}}{128c^{3}}+\frac{9be^{3}x^{7}\sqrt{-c^{2}x^{2}+1}}{800c^{3}}-\frac{3bd^{3}\operatorname{asin}(cx)}{32c^{4}}+\frac{5bd^{2}ex\sqrt{-c^{2}x^{2}+1}}{32c^{5}}+\frac{35bde^{2}x^{3}\sqrt{-c^{2}x^{2}+1}}{512c^{5}}+\frac{21be^{3}x^{5}\sqrt{-c^{2}x^{2}+1}}{1600c^{5}}-\frac{5bd^{2}e\operatorname{asin}(cx)}{32c^{6}}+\frac{105bde^{2}x\sqrt{-c^{2}x^{2}+1}}{1024c^{7}}+\frac{21be^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{1280c^{7}}-\frac{105bde^{2}\operatorname{asin}(cx)}{1024c^{8}}+\frac{63be^{3}x\sqrt{-c^{2}x^{2}+1}}{2560c^{9}}-\frac{63be^{3}\operatorname{asin}(cx)}{2560c^{10}} & \text{for}\: c \neq 0 \\ a\left(\frac{d^{3}x^{4}}{4}+\frac{d^{2}ex^{6}}{2}+\frac{3de^{2}x^{8}}{8}+\frac{e^{3}x^{10}}{10}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**4/4 + a*d**2*e*x**6/2 + 3*a*d*e**2*x**8/8 + a*e**3*x**
10/10 + b*d**3*x**4*asin(c*x)/4 + b*d**2*e*x**6*asin(c*x)/2 + 3*b*d*e**2*x*
*8*asin(c*x)/8 + b*e**3*x**10*asin(c*x)/10 + b*d**3*x**3*sqrt(-c**2*x**2 +
1)/(16*c) + b*d**2*e*x**5*sqrt(-c**2*x**2 + 1)/(12*c) + 3*b*d*e**2*x**7*sqr
t(-c**2*x**2 + 1)/(64*c) + b*e**3*x**9*sqrt(-c**2*x**2 + 1)/(100*c) + 3*b*d
**3*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*d**2*e*x**3*sqrt(-c**2*x**2 + 1)
/(48*c**3) + 7*b*d*e**2*x**5*sqrt(-c**2*x**2 + 1)/(128*c**3) + 9*b*e**3*x**
7*sqrt(-c**2*x**2 + 1)/(800*c**3) - 3*b*d**3*asin(c*x)/(32*c**4) + 5*b*d**2
*e*x*sqrt(-c**2*x**2 + 1)/(32*c**5) + 35*b*d*e**2*x**3*sqrt(-c**2*x**2 + 1)
/(512*c**5) + 21*b*e**3*x**5*sqrt(-c**2*x**2 + 1)/(1600*c**5) - 5*b*d**2*e*
asin(c*x)/(32*c**6) + 105*b*d*e**2*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) + 21*
b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(1280*c**7) - 105*b*d*e**2*asin(c*x)/(1024
*c**8) + 63*b*e**3*x*sqrt(-c**2*x**2 + 1)/(2560*c**9) - 63*b*e**3*asin(c*x)
/(2560*c**10), Ne(c, 0)), (a*(d**3*x**4/4 + d**2*e*x**6/2 + 3*d*e**2*x**8/8
 + e**3*x**10/10), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 807 vs. 2(354) = 708.

time = 0.44, size = 807, normalized size = 2.12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/10*a*e^3*x^10 + 3/8*a*d*e^2*x^8 + 1/2*a*d^2*e*x^6 + 1/4*a*d^3*x^4 - 1/16*
(-c^2*x^2 + 1)^(3/2)*b*d^3*x/c^3 + 1/4*(c^2*x^2 - 1)^2*b*d^3*arcsin(c*x)/c^
4 + 5/32*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 1/12*(c^2*x^2 - 1)^2*sqrt(-c^2*x^
2 + 1)*b*d^2*e*x/c^5 + 1/2*(c^2*x^2 - 1)*b*d^3*arcsin(c*x)/c^4 + 1/2*(c^2*x
^2 - 1)^3*b*d^2*e*arcsin(c*x)/c^6 - 13/48*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*x/c^
5 + 3/64*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^7 + 5/32*b*d^3*arcs
in(c*x)/c^4 + 3/2*(c^2*x^2 - 1)^2*b*d^2*e*arcsin(c*x)/c^6 + 3/8*(c^2*x^2 -
1)^4*b*d*e^2*arcsin(c*x)/c^8 + 11/32*sqrt(-c^2*x^2 + 1)*b*d^2*e*x/c^5 + 25/
128*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^7 + 1/100*(c^2*x^2 - 1)^
4*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 3/2*(c^2*x^2 - 1)*b*d^2*e*arcsin(c*x)/c^
6 + 3/2*(c^2*x^2 - 1)^3*b*d*e^2*arcsin(c*x)/c^8 + 1/10*(c^2*x^2 - 1)^5*b*e^
3*arcsin(c*x)/c^10 - 163/512*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*x/c^7 + 41/800*(c
^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 11/32*b*d^2*e*arcsin(c*x)/c^
6 + 9/4*(c^2*x^2 - 1)^2*b*d*e^2*arcsin(c*x)/c^8 + 1/2*(c^2*x^2 - 1)^4*b*e^3
*arcsin(c*x)/c^10 + 279/1024*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^7 + 171/1600*(c
^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 3/2*(c^2*x^2 - 1)*b*d*e^2*ar
csin(c*x)/c^8 + (c^2*x^2 - 1)^3*b*e^3*arcsin(c*x)/c^10 - 149/1280*(-c^2*x^2
 + 1)^(3/2)*b*e^3*x/c^9 + 279/1024*b*d*e^2*arcsin(c*x)/c^8 + (c^2*x^2 - 1)^
2*b*e^3*arcsin(c*x)/c^10 + 193/2560*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 1/2*(c
^2*x^2 - 1)*b*e^3*arcsin(c*x)/c^10 + 193/2560*b*e^3*arcsin(c*x)/c^10
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(e\,x^2+d\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^3,x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.616 $\int x^2(d+ex^2)^3(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=287

$$\frac{b(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)\sqrt{1-c^2x^2}}{315c^9}-\frac{b(105c^6d^3+378c^4d^2e+405c^2de^2+140e^3)(1-c^2x^2)^{3/2}}{945c^9}$$

```
[Out] -1/945*b*(105*c^6*d^3+378*c^4*d^2*e+405*c^2*d*e^2+140*e^3)*(-c^2*x^2+1)^(3/
2)/c^9+1/525*b*e*(63*c^4*d^2+135*c^2*d*e+70*e^2)*(-c^2*x^2+1)^(5/2)/c^9-1/4
41*b*e^2*(27*c^2*d+28*e)*(-c^2*x^2+1)^(7/2)/c^9+1/81*b*e^3*(-c^2*x^2+1)^(9/
2)/c^9+1/3*d^3*x^3*(a+b*arcsin(c*x))+3/5*d^2*e*x^5*(a+b*arcsin(c*x))+3/7*d*
e^2*x^7*(a+b*arcsin(c*x))+1/9*e^3*x^9*(a+b*arcsin(c*x))+1/315*b*(105*c^6*d^
3+189*c^4*d^2*e+135*c^2*d*e^2+35*e^3)*(-c^2*x^2+1)^(1/2)/c^9
```

Rubi [A]
time = 0.26, antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$,
Rules used = {276, 4815, 12, 1813, 1634}

$$\frac{1}{3}d^3x^3(a+b\text{ArcSin}(cx))+\frac{3}{5}d^2ex^5(a+b\text{ArcSin}(cx))+\frac{3}{7}de^2x^7(a+b\text{ArcSin}(cx))+\frac{1}{9}e^3x^9(a+b\text{ArcSin}(cx))-\frac{be^2(1-c^2x^2)^{7/2}(27c^2d+28e)}{441c^9}+\frac{be^3(1-c^2x^2)^{9/2}}{81c^9}+\frac{be(1-c^2x^2)^{5/2}(63c^4d^2+135c^2de+70e^2)}{525c^9}-\frac{b(1-c^2x^2)^{3/2}(105c^6d^3+378c^4d^2e+405c^2de^2+140e^3)}{945c^9}+\frac{b\sqrt{1-c^2x^2}(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)}{315c^9}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c^2*d*e^2 + 35*e^3)*Sqrt[1 - c^2*x^2]
)/(315*c^9) - (b*(105*c^6*d^3 + 378*c^4*d^2*e + 405*c^2*d*e^2 + 140*e^3)*(1
 - c^2*x^2)^(3/2))/(945*c^9) + (b*e*(63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1
- c^2*x^2)^(5/2))/(525*c^9) - (b*e^2*(27*c^2*d + 28*e)*(1 - c^2*x^2)^(7/2))
/(441*c^9) + (b*e^3*(1 - c^2*x^2)^(9/2))/(81*c^9) + (d^3*x^3*(a + b*ArcSin[
c*x]))/3 + (3*d^2*e*x^5*(a + b*ArcSin[c*x]))/5 + (3*d*e^2*x^7*(a + b*ArcSin
[c*x]))/7 + (e^3*x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
```

```
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}\int x^2\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx &= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\right.\\ &= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\right.\\ &= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\right.\\ &= \frac{1}{3}d^3x^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\sin^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\right.\\ &= \frac{b(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)\sqrt{1-c^2x^2}}{315c^9}-\frac{b(105c^6d^3\ldots}{}\end{aligned}$$

Mathematica [A]
time = 0.15, size = 231, normalized size = 0.80

$$\frac{315ax^3(105d^3+189d^2ex^2+135de^2x^4+35e^3x^6)+\frac{b\sqrt{1-c^2x^2}\left(4480e^3+80c^2e^2(243d+28ex^2)+24c^4e(1323d^2+405dex^2+70e^2x^4)+2c^6(11025d^3+7938d^2ex^2+3645de^2x^4+700e^3x^6)+c^8(11025d^3x^2+11907d^2ex^4+6075de^2x^6+1225e^3x^8)\right)}{c^9}+315bx^3(105d^3+189d^2ex^2+135de^2x^4+35e^3x^6)\,\mathrm{ArcSin}(cx)}{99225}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x^3*(105*d^3 + 189*d^2*e*x^2 + 135*d*e^2*x^4 + 35*e^3*x^6) + (b*Sqrt
[1 - c^2*x^2]*(4480*e^3 + 80*c^2*e^2*(243*d + 28*e*x^2) + 24*c^4*e*(1323*d^
2 + 405*d*e*x^2 + 70*e^2*x^4) + 2*c^6*(11025*d^3 + 7938*d^2*e*x^2 + 3645*d*
```

```
e^2*x^4 + 700*e^3*x^6) + c^8*(11025*d^3*x^2 + 11907*d^2*e*x^4 + 6075*d*e^2*
x^6 + 1225*e^3*x^8)))/c^9 + 315*b*x^3*(105*d^3 + 189*d^2*e*x^2 + 135*d*e^2*
x^4 + 35*e^3*x^6)*ArcSin[c*x])/99225
```

Maple [A]
time = 0.14, size = 417, normalized size = 1.45

method	result
derivativedivides	$\frac{a\left(\frac{1}{3}d^3c^9x^3+\frac{3}{5}d^2c^9e\,x^5+\frac{3}{7}d\,c^9e^2x^7+\frac{1}{9}e^3c^9x^9\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^9x^3}{3}+\frac{3\arcsin(cx)d^2c^9e\,x^5}{5}+\frac{3\arcsin(cx)d\,c^9e^2x^7}{7}+\frac{\arcsin(cx)e^3c^9 \ldots\right.}{\ldots}$
default	$\frac{a\left(\frac{1}{3}d^3c^9x^3+\frac{3}{5}d^2c^9e\,x^5+\frac{3}{7}d\,c^9e^2x^7+\frac{1}{9}e^3c^9x^9\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^9x^3}{3}+\frac{3\arcsin(cx)d^2c^9e\,x^5}{5}+\frac{3\arcsin(cx)d\,c^9e^2x^7}{7}+\frac{\arcsin(cx)e^3c^9 \ldots\right.}{\ldots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(a/c^6*(1/3*d^3*c^9*x^3+3/5*d^2*c^9*e*x^5+3/7*d*c^9*e^2*x^7+1/9*e^3*c
^9*x^9)+b/c^6*(1/3*arcsin(c*x)*d^3*c^9*x^3+3/5*arcsin(c*x)*d^2*c^9*e*x^5+3/
7*arcsin(c*x)*d*c^9*e^2*x^7+1/9*arcsin(c*x)*e^3*c^9*x^9-1/3*d^3*c^6*(-1/3*c
^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-3/5*d^2*c^4*e*(-1/5*c^4*x
^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/
2))-3/7*d*c^2*e^2*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1
)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-1/9*e^3*(
-1/9*c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*
x^4*(-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+
1)^(1/2))))
```

Maxima [A]
time = 0.50, size = 382, normalized size = 1.33

$$\frac{1}{9}ax^9e^3+\frac{3}{7}adx^7e^2+\frac{3}{5}ad^2x^5e+\frac{1}{3}ad^3x^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3+\frac{1}{25}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2e+\frac{3}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right)bde^2+\frac{1}{2835}\left(315x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}\,x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}\,x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}\,x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}\,x^2}{c^8}+\frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right)be^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*x^9*e^3 + 3/7*a*d*x^7*e^2 + 3/5*a*d^2*x^5*e + 1/3*a*d^3*x^3 + 1/9*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)
)*b*d^3 + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt
(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^2*e + 3/245*(35*x
^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c
```

```
^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d*e^2 +
 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^
2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*
x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*e^3
```

Fricas [A]
time = 2.40, size = 270, normalized size = 0.94

$$\frac{11025\,ac^9x^9e^3+42525\,ac^9dx^7e^2+59535\,ac^9d^2x^5e+33075\,ac^9d^3x^3+315\,(35\,bc^9x^9e^3+135\,bc^9dx^7e^2+189\,bc^9d^2x^5e+105\,bc^9d^3x^3)\arcsin(cx)+(11025\,bc^8d^3x^2+22050\,bc^6d^3+35\,(35\,bc^8x^8+40\,bc^6x^6+48\,bc^4x^4+64\,bc^2x^2+128\,b)e^3+1215\,(5\,bc^8dx^6+6\,bc^6dx^4+8\,bc^4dx^2+16\,bc^2d)e^2+3969\,(3\,bc^8d^2x^4+4\,bc^6d^2x^2+8\,bc^4d^2)e)\sqrt{-c^2x^2+1}}{99225\,c^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*x^9*e^3 + 42525*a*c^9*d*x^7*e^2 + 59535*a*c^9*d^2*x^5*
e + 33075*a*c^9*d^3*x^3 + 315*(35*b*c^9*x^9*e^3 + 135*b*c^9*d*x^7*e^2 + 189
*b*c^9*d^2*x^5*e + 105*b*c^9*d^3*x^3)*arcsin(c*x) + (11025*b*c^8*d^3*x^2 +
22050*b*c^6*d^3 + 35*(35*b*c^8*x^8 + 40*b*c^6*x^6 + 48*b*c^4*x^4 + 64*b*c^2
*x^2 + 128*b)*e^3 + 1215*(5*b*c^8*d*x^6 + 6*b*c^6*d*x^4 + 8*b*c^4*d*x^2 + 1
6*b*c^2*d)*e^2 + 3969*(3*b*c^8*d^2*x^4 + 4*b*c^6*d^2*x^2 + 8*b*c^4*d^2)*e)*
sqrt(-c^2*x^2 + 1))/c^9
```

Sympy [A]
time = 1.69, size = 525, normalized size = 1.83

$$\begin{cases} \frac{ad^3x^3}{3}+\frac{3ad^2ex^5}{5}+\frac{3ade^2x^7}{7}+\frac{ae^3x^9}{9}+\frac{bd^3x^3\operatorname{asin}(cx)}{3}+\frac{3bd^2ex^5\operatorname{asin}(cx)}{5}+\frac{3bde^2x^7\operatorname{asin}(cx)}{7}+\frac{be^3x^9\operatorname{asin}(cx)}{9}+\frac{bd^3x^2\sqrt{-c^2x^2+1}}{9c}+\frac{3bd^2ex^4\sqrt{-c^2x^2+1}}{25c}+\frac{3bde^2x^6\sqrt{-c^2x^2+1}}{49c}+\frac{be^3x^8\sqrt{-c^2x^2+1}}{81c}+\frac{2bd^3\sqrt{-c^2x^2+1}}{9c^3}+\frac{4bd^2ex^2\sqrt{-c^2x^2+1}}{25c^3}+\frac{18bde^2x^4\sqrt{-c^2x^2+1}}{245c^3}+\frac{8be^3x^6\sqrt{-c^2x^2+1}}{567c^3}+\frac{8bd^2e\sqrt{-c^2x^2+1}}{25c^5}+\frac{24bde^2x^2\sqrt{-c^2x^2+1}}{245c^5}+\frac{16be^3x^4\sqrt{-c^2x^2+1}}{945c^5}+\frac{48bde^2\sqrt{-c^2x^2+1}}{245c^7}+\frac{64be^3x^2\sqrt{-c^2x^2+1}}{2835c^7}+\frac{128be^3\sqrt{-c^2x^2+1}}{2835c^9} & \text{for}\ c\neq 0 \\ a\left(\frac{d^3x^3}{3}+\frac{3d^2ex^5}{5}+\frac{3de^2x^7}{7}+\frac{e^3x^9}{9}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**3/3 + 3*a*d**2*e*x**5/5 + 3*a*d*e**2*x**7/7 + a*e**3*x
**9/9 + b*d**3*x**3*asin(c*x)/3 + 3*b*d**2*e*x**5*asin(c*x)/5 + 3*b*d*e**2*
x**7*asin(c*x)/7 + b*e**3*x**9*asin(c*x)/9 + b*d**3*x**2*sqrt(-c**2*x**2 +
1)/(9*c) + 3*b*d**2*e*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 3*b*d*e**2*x**6*sq
rt(-c**2*x**2 + 1)/(49*c) + b*e**3*x**8*sqrt(-c**2*x**2 + 1)/(81*c) + 2*b*d
**3*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(2
5*c**3) + 18*b*d*e**2*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) + 8*b*e**3*x**6*
sqrt(-c**2*x**2 + 1)/(567*c**3) + 8*b*d**2*e*sqrt(-c**2*x**2 + 1)/(25*c**5)
 + 24*b*d*e**2*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**3*x**4*sqrt(-
c**2*x**2 + 1)/(945*c**5) + 48*b*d*e**2*sqrt(-c**2*x**2 + 1)/(245*c**7) + 6
4*b*e**3*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e**3*sqrt(-c**2*x**2
 + 1)/(2835*c**9), Ne(c, 0)), (a*(d**3*x**3/3 + 3*d**2*e*x**5/5 + 3*d*e**2*
x**7/7 + e**3*x**9/9), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 711 vs. 2(259) = 518.
time = 0.42, size = 711, normalized size = 2.48

$$\frac{1}{9}ae^3x^9+\frac{3}{7}ade^2x^7+\frac{3}{5}ad^2ex^5+\frac{1}{3}ad^3x^3+\frac{(c^2x^2-1)bd^3x\arcsin(cx)}{3c^2}+\frac{bd^3x\arcsin(cx)}{3c^2}+\frac{3(c^2x^2-1)^2bd^2ex\arcsin(cx)}{5c^4}+\frac{6(c^2x^2-1)bd^2ex\arcsin(cx)}{5c^4}+\frac{3(c^2x^2-1)^3bde^2x\arcsin(cx)}{7c^6}-\frac{(-c^2x^2+1)^{\frac{3}{2}}bd^3}{9c^3}+\frac{3bd^2ex\arcsin(cx)}{5c^4}+\frac{9(c^2x^2-1)^2bde^2x\arcsin(cx)}{7c^6}+\frac{(c^2x^2-1)^4be^3x\arcsin(cx)}{9c^8}+\frac{\sqrt{-c^2x^2+1}\,bd^3}{3c^3}+\frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bd^2e}{25c^5}+\frac{9(c^2x^2-1)bde^2x\arcsin(cx)}{7c^6}+\frac{4(c^2x^2-1)^3be^3x\arcsin(cx)}{9c^8}-\frac{2(-c^2x^2+1)^{\frac{3}{2}}bd^2e}{5c^5}+\frac{3(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,bde^2}{49c^7}+\frac{3bde^2x\arcsin(cx)}{7c^6}+\frac{2(c^2x^2-1)^2be^3x\arcsin(cx)}{3c^8}+\frac{3\sqrt{-c^2x^2+1}\,bd^2e}{5c^5}+\frac{9(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bde^2}{35c^7}+\frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}\,be^3}{81c^9}+\frac{4(c^2x^2-1)be^3x\arcsin(cx)}{9c^8}-\frac{3(-c^2x^2+1)^{\frac{3}{2}}bde^2}{7c^7}+\frac{4(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,be^3}{63c^9}+\frac{be^3x\arcsin(cx)}{9c^8}+\frac{3\sqrt{-c^2x^2+1}\,bde^2}{7c^7}+\frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^3}{15c^9}-\frac{4(-c^2x^2+1)^{\frac{3}{2}}be^3}{27c^9}+\frac{\sqrt{-c^2x^2+1}\,be^3}{9c^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*e^3*x^9 + 3/7*a*d*e^2*x^7 + 3/5*a*d^2*e*x^5 + 1/3*a*d^3*x^3 + 1/3*(c^
2*x^2 - 1)*b*d^3*x*arcsin(c*x)/c^2 + 1/3*b*d^3*x*arcsin(c*x)/c^2 + 3/5*(c^2
*x^2 - 1)^2*b*d^2*e*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d^2*e*x*arcsin(
c*x)/c^4 + 3/7*(c^2*x^2 - 1)^3*b*d*e^2*x*arcsin(c*x)/c^6 - 1/9*(-c^2*x^2 +
1)^(3/2)*b*d^3/c^3 + 3/5*b*d^2*e*x*arcsin(c*x)/c^4 + 9/7*(c^2*x^2 - 1)^2*b*
d*e^2*x*arcsin(c*x)/c^6 + 1/9*(c^2*x^2 - 1)^4*b*e^3*x*arcsin(c*x)/c^8 + 1/3
*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 + 3/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d
^2*e/c^5 + 9/7*(c^2*x^2 - 1)*b*d*e^2*x*arcsin(c*x)/c^6 + 4/9*(c^2*x^2 - 1)^
3*b*e^3*x*arcsin(c*x)/c^8 - 2/5*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^5 + 3/49*(c^
2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^7 + 3/7*b*d*e^2*x*arcsin(c*x)/c^6
 + 2/3*(c^2*x^2 - 1)^2*b*e^3*x*arcsin(c*x)/c^8 + 3/5*sqrt(-c^2*x^2 + 1)*b*d
^2*e/c^5 + 9/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^7 + 1/81*(c^2*
x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^3/c^9 + 4/9*(c^2*x^2 - 1)*b*e^3*x*arcsin(
c*x)/c^8 - 3/7*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/c^7 + 4/63*(c^2*x^2 - 1)^3*sqrt
(-c^2*x^2 + 1)*b*e^3/c^9 + 1/9*b*e^3*x*arcsin(c*x)/c^8 + 3/7*sqrt(-c^2*x^2
+ 1)*b*d*e^2/c^7 + 2/15*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3/c^9 - 4/27
*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^9 + 1/9*sqrt(-c^2*x^2 + 1)*b*e^3/c^9
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^3,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.617 $\int x(d+ex^2)^3 (a+b\textbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=258

$$\frac{5b(2c^2d+e)\left(40c^4d^2+40c^2de+21e^2\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b\left(104c^4d^2+104c^2de+35e^2\right)x\sqrt{1-c^2x^2}\,(d+ex^2)}{1536c^5}+\cdots$$

```
[Out] -1/1024*b*(128*c^8*d^4+256*c^6*d^3*e+288*c^4*d^2*e^2+160*c^2*d*e^3+35*e^4)*
arcsin(c*x)/c^8/e+1/8*(e*x^2+d)^4*(a+b*arcsin(c*x))/e+5/3072*b*(2*c^2*d+e)*
(40*c^4*d^2+40*c^2*d*e+21*e^2)*x*(-c^2*x^2+1)^(1/2)/c^7+1/1536*b*(104*c^4*d
^2+104*c^2*d*e+35*e^2)*x*(e*x^2+d)*(-c^2*x^2+1)^(1/2)/c^5+7/384*b*(2*c^2*d+
e)*x*(e*x^2+d)^2*(-c^2*x^2+1)^(1/2)/c^3+1/64*b*x*(e*x^2+d)^3*(-c^2*x^2+1)^(
1/2)/c
```

Rubi [A]

time = 0.20, antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {4813, 427, 542, 396, 222}

$$\frac{(d+ex^2)^4(a+b\text{ArcSin}(cx))}{8e}-\frac{b\text{ArcSin}(cx)\left(128c^8d^4+256c^6d^3e+288c^4d^2e^2+160c^2de^3+35e^4\right)}{1024c^8e}+\frac{bx\sqrt{1-c^2x^2}\,(d+ex^2)^3}{64c}+\frac{7bx\sqrt{1-c^2x^2}\,(2c^2d+e)(d+ex^2)^2}{384c^3}+\frac{5bx\sqrt{1-c^2x^2}\,(2c^2d+e)\left(40c^4d^2+40c^2de+21e^2\right)}{3072c^7}+\frac{bx\sqrt{1-c^2x^2}\left(104c^4d^2+104c^2de+35e^2\right)(d+ex^2)}{1536c^5}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*(2*c^2*d + e)*(40*c^4*d^2 + 40*c^2*d*e + 21*e^2)*x*Sqrt[1 - c^2*x^2])/
(3072*c^7) + (b*(104*c^4*d^2 + 104*c^2*d*e + 35*e^2)*x*Sqrt[1 - c^2*x^2]*(d
 + e*x^2))/(1536*c^5) + (7*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^
2)/(384*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^3)/(64*c) - (b*(128*c^8*d
^4 + 256*c^6*d^3*e + 288*c^4*d^2*e^2 + 160*c^2*d*e^3 + 35*e^4)*ArcSin[c*x])
/(1024*c^8*e) + ((d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 427

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[d*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q - 1)/(b*(n*(p + q) + 1))),
```

```
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 542

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[f*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^q/(
b*(n*(p + q + 1) + 1))), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)^3\left(a+b\sin^{-1}(cx)\right)\,dx=\frac{\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^4}{\sqrt{1-c^2x^2}}\,dx}{8e}$$

$$=\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^3}{64c}+\frac{\left(d+ex^2\right)^4\left(a+b\sin^{-1}(cx)\right)}{8e}+\frac{b\int\frac{\left(d+ex^2\right)^2(}{}}{}$$

$$=\frac{7b(2c^2d+e)\,x\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}{384c^3}+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^3}{64c}+\frac{(d}{}$$

$$=\frac{b(104c^4d^2+104c^2de+35e^2)\,x\sqrt{1-c^2x^2}\left(d+ex^2\right)}{1536c^5}+\frac{7b(2c^2d+e)\,x}{}$$

$$=\frac{5b(2c^2d+e)\left(40c^4d^2+40c^2de+21e^2\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b(104c^4d^2+10}{}$$

$$=\frac{5b(2c^2d+e)\left(40c^4d^2+40c^2de+21e^2\right)x\sqrt{1-c^2x^2}}{3072c^7}+\frac{b(104c^4d^2+10}{}$$

Mathematica [A]

time = 0.14, size = 232, normalized size = 0.90

$$\frac{cx\left(384ac^7x(4d^3+6d^2ex^2+4de^2x^4+e^3x^6)+b\sqrt{1-c^2x^2}\,(105e^3+10c^2e^2(48d+7ex^2)+8c^4e(108d^2+40dex^2+7e^2x^4)+16c^6(48d^3+36d^2ex^2+16de^2x^4+3e^3x^6))\right)+3b(-256c^6d^3-288c^4d^2e-160c^2de^2-35e^3+128c^8(4d^3x^2+6d^2ex^4+4de^2x^6+e^3x^8))\operatorname{ArcSin}(cx)}{3072c^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(384*a*c^7*x*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^2*x^4 + e^3*x^6) + b*Sqrt[1
- c^2*x^2]*(105*e^3 + 10*c^2*e^2*(48*d + 7*e*x^2) + 8*c^4*e*(108*d^2 + 40*d
*e*x^2 + 7*e^2*x^4) + 16*c^6*(48*d^3 + 36*d^2*e*x^2 + 16*d*e^2*x^4 + 3*e^3*
x^6))) + 3*b*(-256*c^6*d^3 - 288*c^4*d^2*e - 160*c^2*d*e^2 - 35*e^3 + 128*c
^8*(4*d^3*x^2 + 6*d^2*e*x^4 + 4*d*e^2*x^6 + e^3*x^8))*ArcSin[c*x])/(3072*c^
8)
```

Maple [A]

time = 0.13, size = 376, normalized size = 1.46

method	result
derivativedivides	$\frac{\frac{\left(c^2e\,x^2+c^2d\right)^4a}{8c^6e}+\frac{b\left(\frac{\arcsin(cx)c^8d^4}{8e}+\frac{\arcsin(cx)c^8d^3x^2}{2}+\frac{3e\arcsin(cx)c^8d^2x^4}{4}+\frac{e^2\arcsin(cx)c^8d\,x^6}{2}+\frac{e^3\arcsin(cx)c^8x^8}{8}-\frac{c^8d^4\,\mathrm{arc}}{}\right.}{}}{}$
default	$\frac{\frac{\left(c^2e\,x^2+c^2d\right)^4a}{8c^6e}+\frac{b\left(\frac{\arcsin(cx)c^8d^4}{8e}+\frac{\arcsin(cx)c^8d^3x^2}{2}+\frac{3e\arcsin(cx)c^8d^2x^4}{4}+\frac{e^2\arcsin(cx)c^8d\,x^6}{2}+\frac{e^3\arcsin(cx)c^8x^8}{8}-\frac{c^8d^4\,\mathrm{arc}}{}\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/8*(c^2*e*x^2+c^2*d)^4*a/c^6/e+b/c^6*(1/8/e*arcsin(c*x)*c^8*d^4+1/2
*arcsin(c*x)*c^8*d^3*x^2+3/4*e*arcsin(c*x)*c^8*d^2*x^4+1/2*e^2*arcsin(c*x)*
c^8*d*x^6+1/8*e^3*arcsin(c*x)*c^8*x^8-1/8/e*(c^8*d^4*arcsin(c*x)+4*c^6*d^3*
e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+6*c^4*d^2*e^2*(-1/4*c^3*x^3
*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+4*d*c^2*e^3
*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*
(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))+e^4*(-1/8*c^7*x^7*(-c^2*x^2+1)^(1/2)-7
/48*c^5*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^3*(-c^2*x^2+1)^(1/2)-35/128*c*x
*(-c^2*x^2+1)^(1/2)+35/128*arcsin(c*x)))))
```

Maxima [A]

time = 0.50, size = 342, normalized size = 1.33

$$\frac{1}{8}\,ax^8e^3+\frac{1}{2}\,adx^6e^2+\frac{3}{4}\,ad^2x^4e+\frac{1}{2}\,ad^3x^2+\frac{1}{4}\left(2\,x^2\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x}{c^2}-\frac{\arcsin\left(cx\right)}{c^3}\right)\right)bd^3+\frac{3}{32}\left(8\,x^4\arcsin\left(cx\right)+\left(\frac{2\,\sqrt{-c^2x^2+1}\,x^3}{c^2}+\frac{3\,\sqrt{-c^2x^2+1}\,x}{c^4}-\frac{3\,\arcsin\left(cx\right)}{c^5}\right)c\right)bd^2e+\frac{1}{96}\left(48\,x^6\arcsin\left(cx\right)+\left(\frac{8\,\sqrt{-c^2x^2+1}\,x^5}{c^2}+\frac{10\,\sqrt{-c^2x^2+1}\,x^3}{c^4}+\frac{15\,\sqrt{-c^2x^2+1}\,x}{c^6}-\frac{15\,\arcsin\left(cx\right)}{c^7}\right)c\right)bde^2+\frac{1}{3072}\left(384\,x^8\arcsin\left(cx\right)+\left(\frac{48\,\sqrt{-c^2x^2+1}\,x^7}{c^2}+\frac{56\,\sqrt{-c^2x^2+1}\,x^5}{c^4}+\frac{70\,\sqrt{-c^2x^2+1}\,x^3}{c^6}+\frac{105\,\sqrt{-c^2x^2+1}\,x}{c^8}-\frac{105\,\arcsin\left(cx\right)}{c^9}\right)c\right)be^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*x^8*e^3 + 1/2*a*d*x^6*e^2 + 3/4*a*d^2*x^4*e + 1/2*a*d^3*x^2 + 1/4*(2*
x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3 + 3
/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 +
1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^2*e + 1/96*(48*x^6*arcsin(c*x) + (8*sq
rt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2
 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*d*e^2 + 1/3072*(384*x^8*arcsin(c*x)
+ (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(
-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)
*c)*b*e^3
```

Fricas [A]
time = 1.80, size = 267, normalized size = 1.03

$$\frac{384\,ac^8x^8e^3 + 1536\,ac^8dx^6e^2 + 2304\,ac^8d^2x^4e + 1536\,ac^8d^3x^2 + 3\,(512\,bc^8d^3x^2 - 256\,bc^6d^3 + (128\,bc^8x^8 - 35\,b)e^3 + 32\,(16\,bc^8dx^6 - 5\,bc^2d)e^2 + 96\,(8\,bc^8d^2x^4 - 3\,bc^4d^2)e)\arcsin(cx) + (768\,bc^7d^3x + (48\,bc^7x^7 + 56\,bc^5x^5 + 70\,bc^3x^3 + 105\,bcx)e^3 + 32\,(8\,bc^7dx^5 + 10\,bc^5dx^3 + 15\,bc^3dx)e^2 + 288\,(2\,bc^7d^2x^3 + 3\,bc^5d^2x)e)\sqrt{-c^2x^2+1}}{3072\,c^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3072*(384*a*c^8*x^8*e^3 + 1536*a*c^8*d*x^6*e^2 + 2304*a*c^8*d^2*x^4*e + 1
536*a*c^8*d^3*x^2 + 3*(512*b*c^8*d^3*x^2 - 256*b*c^6*d^3 + (128*b*c^8*x^8 -
 35*b)*e^3 + 32*(16*b*c^8*d*x^6 - 5*b*c^2*d)*e^2 + 96*(8*b*c^8*d^2*x^4 - 3*
b*c^4*d^2)*e)*arcsin(c*x) + (768*b*c^7*d^3*x + (48*b*c^7*x^7 + 56*b*c^5*x^5
 + 70*b*c^3*x^3 + 105*b*c*x)*e^3 + 32*(8*b*c^7*d*x^5 + 10*b*c^5*d*x^3 + 15*
b*c^3*d*x)*e^2 + 288*(2*b*c^7*d^2*x^3 + 3*b*c^5*d^2*x)*e)*sqrt(-c^2*x^2 + 1
))/c^8
```

Sympy [A]
time = 1.20, size = 483, normalized size = 1.87

$$\begin{cases} \frac{ad^3x^2}{2} + \frac{3ad^2ex^4}{4} + \frac{ade^2x^6}{2} + \frac{ae^3x^8}{8} + \frac{bd^3x^2\operatorname{asin}(cx)}{2} + \frac{3bd^2ex^4\operatorname{asin}(cx)}{4} + \frac{bde^2x^6\operatorname{asin}(cx)}{2} + \frac{be^3x^8\operatorname{asin}(cx)}{8} + \frac{bd^3x\sqrt{-c^2x^2+1}}{4c} + \frac{3bd^2ex^3\sqrt{-c^2x^2+1}}{16c} + \frac{bde^2x^5\sqrt{-c^2x^2+1}}{12c} + \frac{be^3x^7\sqrt{-c^2x^2+1}}{64c} - \frac{bd^3\operatorname{asin}(cx)}{4c^2} + \frac{9bd^2ex\sqrt{-c^2x^2+1}}{32c^3} + \frac{5bde^2x^3\sqrt{-c^2x^2+1}}{48c^3} + \frac{7be^3x^5\sqrt{-c^2x^2+1}}{384c^3} - \frac{9bd^2e\operatorname{asin}(cx)}{32c^4} + \frac{5bde^2x\sqrt{-c^2x^2+1}}{32c^5} + \frac{35be^3x^3\sqrt{-c^2x^2+1}}{1536c^5} - \frac{5bde^2\operatorname{asin}(cx)}{32c^6} + \frac{35be^3x\sqrt{-c^2x^2+1}}{1024c^7} - \frac{35be^3\operatorname{asin}(cx)}{1024c^8} & \text{for}\; c \neq 0 \\ a\left(\frac{d^3x^2}{2} + \frac{3d^2ex^4}{4} + \frac{de^2x^6}{2} + \frac{e^3x^8}{8}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**2/2 + 3*a*d**2*e*x**4/4 + a*d*e**2*x**6/2 + a*e**3*x**
8/8 + b*d**3*x**2*asin(c*x)/2 + 3*b*d**2*e*x**4*asin(c*x)/4 + b*d*e**2*x**6
*asin(c*x)/2 + b*e**3*x**8*asin(c*x)/8 + b*d**3*x*sqrt(-c**2*x**2 + 1)/(4*c
) + 3*b*d**2*e*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*d*e**2*x**5*sqrt(-c**2*
x**2 + 1)/(12*c) + b*e**3*x**7*sqrt(-c**2*x**2 + 1)/(64*c) - b*d**3*asin(c*
x)/(4*c**2) + 9*b*d**2*e*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*d*e**2*x**3
*sqrt(-c**2*x**2 + 1)/(48*c**3) + 7*b*e**3*x**5*sqrt(-c**2*x**2 + 1)/(384*c
**3) - 9*b*d**2*e*asin(c*x)/(32*c**4) + 5*b*d*e**2*x*sqrt(-c**2*x**2 + 1)/(
```

```
32*c**5) + 35*b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(1536*c**5) - 5*b*d*e**2*asi
n(c*x)/(32*c**6) + 35*b*e**3*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) - 35*b*e**3
*asin(c*x)/(1024*c**8), Ne(c, 0)), (a*(d**3*x**2/2 + 3*d**2*e*x**4/4 + d*e*
*2*x**6/2 + e**3*x**8/8), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 597 vs. 2(238) = 476.
time = 0.42, size = 597, normalized size = 2.31

$$\frac{1}{8}ae^3x^8+\frac{1}{2}ade^2x^6+\frac{3}{4}ad^2ex^4+\frac{\sqrt{-c^2x^2+1}\,bd^3x}{4c}+\frac{(c^2x^2-1)bd^3\arcsin(cx)}{2c^2}-\frac{3(-c^2x^2+1)^{\frac{3}{2}}bd^2ex}{16c^3}+\frac{(c^2x^2-1)ad^3}{2c^2}+\frac{bd^3\arcsin(cx)}{4c^2}+\frac{3(c^2x^2-1)^2bd^2e\arcsin(cx)}{4c^4}+\frac{15\sqrt{-c^2x^2+1}\,bd^2ex}{32c^3}+\frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bde^2x}{12c^5}+\frac{3(c^2x^2-1)bd^2e\arcsin(cx)}{2c^4}+\frac{(c^2x^2-1)^3bde^2\arcsin(cx)}{2c^6}-\frac{13(-c^2x^2+1)^{\frac{3}{2}}bde^2x}{48c^5}+\frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,be^3x}{64c^7}+\frac{15bd^2e\arcsin(cx)}{32c^4}+\frac{3(c^2x^2-1)^2bde^2\arcsin(cx)}{2c^6}+\frac{(c^2x^2-1)^4be^3\arcsin(cx)}{8c^8}+\frac{11\sqrt{-c^2x^2+1}\,bde^2x}{32c^5}+\frac{25(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^3x}{384c^7}+\frac{3(c^2x^2-1)bde^2\arcsin(cx)}{2c^6}+\frac{(c^2x^2-1)^3be^3\arcsin(cx)}{2c^8}-\frac{163(-c^2x^2+1)^{\frac{3}{2}}be^3x}{1536c^7}+\frac{11bde^2\arcsin(cx)}{32c^6}+\frac{3(c^2x^2-1)^2be^3\arcsin(cx)}{4c^8}+\frac{93\sqrt{-c^2x^2+1}\,be^3x}{1024c^7}+\frac{(c^2x^2-1)be^3\arcsin(cx)}{2c^8}+\frac{93be^3\arcsin(cx)}{1024c^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/8*a*e^3*x^8 + 1/2*a*d*e^2*x^6 + 3/4*a*d^2*e*x^4 + 1/4*sqrt(-c^2*x^2 + 1)*
b*d^3*x/c + 1/2*(c^2*x^2 - 1)*b*d^3*arcsin(c*x)/c^2 - 3/16*(-c^2*x^2 + 1)^(
3/2)*b*d^2*e*x/c^3 + 1/2*(c^2*x^2 - 1)*a*d^3/c^2 + 1/4*b*d^3*arcsin(c*x)/c^
2 + 3/4*(c^2*x^2 - 1)^2*b*d^2*e*arcsin(c*x)/c^4 + 15/32*sqrt(-c^2*x^2 + 1)*
b*d^2*e*x/c^3 + 1/12*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^5 + 3/2
*(c^2*x^2 - 1)*b*d^2*e*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^3*b*d*e^2*arcsin
(c*x)/c^6 - 13/48*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*x/c^5 + 1/64*(c^2*x^2 - 1)^3
*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^7 + 15/32*b*d^2*e*arcsin(c*x)/c^4 + 3/2*(c^2*
x^2 - 1)^2*b*d*e^2*arcsin(c*x)/c^6 + 1/8*(c^2*x^2 - 1)^4*b*e^3*arcsin(c*x)/
c^8 + 11/32*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^5 + 25/384*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*b*e^3*x/c^7 + 3/2*(c^2*x^2 - 1)*b*d*e^2*arcsin(c*x)/c^6 + 1/2
*(c^2*x^2 - 1)^3*b*e^3*arcsin(c*x)/c^8 - 163/1536*(-c^2*x^2 + 1)^(3/2)*b*e^
3*x/c^7 + 11/32*b*d*e^2*arcsin(c*x)/c^6 + 3/4*(c^2*x^2 - 1)^2*b*e^3*arcsin(
c*x)/c^8 + 93/1024*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^7 + 1/2*(c^2*x^2 - 1)*b*e^3
*arcsin(c*x)/c^8 + 93/1024*b*e^3*arcsin(c*x)/c^8
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*asin(c*x))*(d + e*x^2)^3,x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.618 $\int (d+ex^2)^3 (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=225

$$\frac{b(35c^6d^3+35c^4d^2e+21c^2de^2+5e^3)\sqrt{1-c^2x^2}}{35c^7}-\frac{be(35c^4d^2+42c^2de+15e^2)(1-c^2x^2)^{3/2}}{105c^7}+\frac{3be^2(7c^2d+5e)}{175}$$

```
[Out] -1/105*b*e*(35*c^4*d^2+42*c^2*d*e+15*e^2)*(-c^2*x^2+1)^(3/2)/c^7+3/175*b*e^
2*(7*c^2*d+5*e)*(-c^2*x^2+1)^(5/2)/c^7-1/49*b*e^3*(-c^2*x^2+1)^(7/2)/c^7+d^
3*x*(a+b*arcsin(c*x))+d^2*e*x^3*(a+b*arcsin(c*x))+3/5*d*e^2*x^5*(a+b*arcsin
(c*x))+1/7*e^3*x^7*(a+b*arcsin(c*x))+1/35*b*(35*c^6*d^3+35*c^4*d^2*e+21*c^2
*d*e^2+5*e^3)*(-c^2*x^2+1)^(1/2)/c^7
```

Rubi [A]
time = 0.18, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.278$, Rules used = {200, 4755, 12, 1813, 1864}

$$d^3x(a+b\text{ArcSin}(cx))+d^2ex^3(a+b\text{ArcSin}(cx))+\frac{3}{5}de^2x^5(a+b\text{ArcSin}(cx))+\frac{1}{7}e^3x^7(a+b\text{ArcSin}(cx))+\frac{3be^2(1-c^2x^2)^{5/2}(7c^2d+5e)}{175c^7}-\frac{be^3(1-c^2x^2)^{7/2}}{49c^7}-\frac{be(1-c^2x^2)^{3/2}(35c^4d^2+42c^2de+15e^2)}{105c^7}+\frac{b\sqrt{1-c^2x^2}(35c^6d^3+35c^4d^2e+21c^2de^2+5e^3)}{35c^7}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(35*c^6*d^3 + 35*c^4*d^2*e + 21*c^2*d*e^2 + 5*e^3)*Sqrt[1 - c^2*x^2])/(3
5*c^7) - (b*e*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*(1 - c^2*x^2)^(3/2))/(105*
c^7) + (3*b*e^2*(7*c^2*d + 5*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^3*(1
- c^2*x^2)^(7/2))/(49*c^7) + d^3*x*(a + b*ArcSin[c*x]) + d^2*e*x^3*(a + b*A
rcSin[c*x]) + (3*d*e^2*x^5*(a + b*ArcSin[c*x]))/5 + (e^3*x^7*(a + b*ArcSin[
c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\int \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right)\,dx = d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)+d^2ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}(c\right.$$

$$= \frac{b(35c^6d^3+35c^4d^2e+21c^2de^2+5e^3)\sqrt{1-c^2x^2}}{35c^7}-\frac{be(35c^4d^2+42c^2d}{}$$

Mathematica [A]
time = 0.13, size = 187, normalized size = 0.83

$$\frac{105ax(35d^3+35d^2ex^2+21de^2x^4+5e^3x^6)+\frac{b\sqrt{1-c^2x^2}\,(240e^3+24c^2e^2(49d+5ex^2)+2c^4e(1225d^2+294dex^2+45e^2x^4)+c^6(3675d^3+1225d^2ex^2+441de^2x^4+75e^3x^6))}{c^7}+105bx(35d^3+35d^2ex^2+21de^2x^4+5e^3x^6)\,\mathrm{ArcSin}(cx)}{3675}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (105*a*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6) + (b*Sqrt[1 - c
^2*x^2]*(240*e^3 + 24*c^2*e^2*(49*d + 5*e*x^2) + 2*c^4*e*(1225*d^2 + 294*d*
e*x^2 + 45*e^2*x^4) + c^6*(3675*d^3 + 1225*d^2*e*x^2 + 441*d*e^2*x^4 + 75*e
^3*x^6)))/c^7 + 105*b*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6)*
ArcSin[c*x])/3675
```

Maple [A]

time = 0.09, size = 325, normalized size = 1.44

method	result
derivativedivides	$\frac{\frac{a\left(d^{3} c^{7} x+d^{2} c^{7} e\, x^{3}+\frac{3}{5} d\, c^{7} e^{2} x^{5}+\frac{1}{7} e^{3} c^{7} x^{7}\right)}{c^{6}}+\frac{b\left(\arcsin (c x) d^{3} c^{7} x+\arcsin (c x) d^{2} c^{7} e\, x^{3}+\frac{3 \arcsin (c x) d\, c^{7} e^{2} x^{5}}{5}+\frac{\arcsin (c x) e^{3} c^{7} x^{7}}{7}+d^{3} c^{6}\right.}{}}{}$
default	$\frac{\frac{a\left(d^{3} c^{7} x+d^{2} c^{7} e\, x^{3}+\frac{3}{5} d\, c^{7} e^{2} x^{5}+\frac{1}{7} e^{3} c^{7} x^{7}\right)}{c^{6}}+\frac{b\left(\arcsin (c x) d^{3} c^{7} x+\arcsin (c x) d^{2} c^{7} e\, x^{3}+\frac{3 \arcsin (c x) d\, c^{7} e^{2} x^{5}}{5}+\frac{\arcsin (c x) e^{3} c^{7} x^{7}}{7}+d^{3} c^{6}\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/c^6*(d^3*c^7*x+d^2*c^7*e*x^3+3/5*d*c^7*e^2*x^5+1/7*e^3*c^7*x^7)+b/c^
6*(arcsin(c*x)*d^3*c^7*x+arcsin(c*x)*d^2*c^7*e*x^3+3/5*arcsin(c*x)*d*c^7*e^
2*x^5+1/7*arcsin(c*x)*e^3*c^7*x^7+d^3*c^6*(-c^2*x^2+1)^(1/2)-d^2*c^4*e*(-1/
3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-3/5*d*c^2*e^2*(-1/5*c^
4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^
(1/2))-1/7*e^3*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(
1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))))
```

Maxima [A]

time = 0.49, size = 290, normalized size = 1.29

$$\frac{1}{7}\,ax^7e^3+\frac{3}{5}\,adx^5e^2+ad^2x^3e+ad^3x+\frac{1}{3}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2e+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bd^3}{c}+\frac{1}{25}\left(15\,x^5\arcsin(cx)+\left(\frac{3\,\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bde^2+\frac{1}{245}\left(35\,x^7\arcsin(cx)+\left(\frac{5\,\sqrt{-c^2x^2+1}\,x^6}{c^2}+\frac{6\,\sqrt{-c^2x^2+1}\,x^4}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}\,x^2}{c^6}+\frac{16\,\sqrt{-c^2x^2+1}}{c^8}\right)c\right)be^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*x^7*e^3 + 3/5*a*d*x^5*e^2 + a*d^2*x^3*e + a*d^3*x + 1/3*(3*x^3*arcsin
(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2*e
+ (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^3/c + 1/25*(15*x^5*arcsin(c*x)
 + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c
^2*x^2 + 1)/c^6)*c)*b*d*e^2 + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2
+ 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6
+ 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*e^3
```

Fricas [A]

time = 1.06, size = 222, normalized size = 0.99

$$\frac{525\,ac^7x^7e^3+2205\,ac^7dx^5e^2+3675\,ac^7d^2x^3e+3675\,ac^7d^3x+105\,(5\,bc^7x^7e^3+21\,bc^7dx^5e^2+35\,bc^7d^2x^3e+35\,bc^7d^3x)\arcsin(cx)+(3675\,bc^6d^3+15\,(5\,bc^6x^6+6\,bc^4x^4+8\,bc^2x^2+16\,b)e^3+147\,(3\,bc^6dx^4+4\,bc^4dx^2+8\,bc^2d)e^2+1225\,(bc^6d^2x^2+2\,bc^4d^2)e)\sqrt{-c^2x^2+1}}{3675\,c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3675*(525*a*c^7*x^7*e^3 + 2205*a*c^7*d*x^5*e^2 + 3675*a*c^7*d^2*x^3*e + 3
675*a*c^7*d^3*x + 105*(5*b*c^7*x^7*e^3 + 21*b*c^7*d*x^5*e^2 + 35*b*c^7*d^2*
x^3*e + 35*b*c^7*d^3*x)*arcsin(c*x) + (3675*b*c^6*d^3 + 15*(5*b*c^6*x^6 + 6
*b*c^4*x^4 + 8*b*c^2*x^2 + 16*b)*e^3 + 147*(3*b*c^6*d*x^4 + 4*b*c^4*d*x^2 +
 8*b*c^2*d)*e^2 + 1225*(b*c^6*d^2*x^2 + 2*b*c^4*d^2)*e)*sqrt(-c^2*x^2 + 1))
/c^7
```

Sympy [**A**]
time = 0.77, size = 389, normalized size = 1.73

$$\begin{cases} ad^3x + ad^2ex^3 + \frac{3ade^2x^5}{5} + \frac{ae^3x^7}{7} + bd^3x\operatorname{asin}(cx) + bd^2ex^3\operatorname{asin}(cx) + \frac{3bde^2x^5\operatorname{asin}(cx)}{5} + \frac{be^3x^7\operatorname{asin}(cx)}{7} + \frac{bd^3\sqrt{-c^2x^2+1}}{c} + \frac{bd^2ex^2\sqrt{-c^2x^2+1}}{3c} + \frac{3bde^2x^4\sqrt{-c^2x^2+1}}{25c} + \frac{be^3x^6\sqrt{-c^2x^2+1}}{49c} + \frac{2bd^2e\sqrt{-c^2x^2+1}}{3c^3} + \frac{4bde^2x^2\sqrt{-c^2x^2+1}}{25c^3} + \frac{6be^3x^4\sqrt{-c^2x^2+1}}{245c^3} + \frac{8bde^2\sqrt{-c^2x^2+1}}{25c^5} + \frac{8be^3x^2\sqrt{-c^2x^2+1}}{245c^5} + \frac{16be^3\sqrt{-c^2x^2+1}}{245c^7} & \text{for } c \neq 0 \\ a\left(d^3x + d^2ex^3 + \frac{3de^2x^5}{5} + \frac{e^3x^7}{7}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x + a*d**2*e*x**3 + 3*a*d*e**2*x**5/5 + a*e**3*x**7/7 + b
*d**3*x*asin(c*x) + b*d**2*e*x**3*asin(c*x) + 3*b*d*e**2*x**5*asin(c*x)/5 +
 b*e**3*x**7*asin(c*x)/7 + b*d**3*sqrt(-c**2*x**2 + 1)/c + b*d**2*e*x**2*sq
rt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*
e**3*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + 2*b*d**2*e*sqrt(-c**2*x**2 + 1)/(3*
c**3) + 4*b*d*e**2*x**2*sqrt(-c**2*x**2 + 1)/(25*c**3) + 6*b*e**3*x**4*sqrt
(-c**2*x**2 + 1)/(245*c**3) + 8*b*d*e**2*sqrt(-c**2*x**2 + 1)/(25*c**5) + 8
*b*e**3*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**3*sqrt(-c**2*x**2 +
1)/(245*c**7), Ne(c, 0)), (a*(d**3*x + d**2*e*x**3 + 3*d*e**2*x**5/5 + e**3
*x**7/7), True))
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 480 vs. $2(205) =$ 410.
time = 0.43, size = 480, normalized size = 2.13

$$\frac{1}{7}ae^3x^7 + \frac{3}{5}ade^2x^5 + ad^2ex^3 + bd^3x\arcsin(cx) + ad^3x + \frac{(c^2x^2-1)bd^2ex\arcsin(cx)}{c^2} + \frac{bd^2ex\arcsin(cx)}{c^2} + \frac{3(c^2x^2-1)^2bde^2x\arcsin(cx)}{5c^4} + \frac{\sqrt{-c^2x^2+1}\,bd^3}{c} + \frac{6(c^2x^2-1)bde^2x\arcsin(cx)}{5c^4} + \frac{(c^2x^2-1)^3be^3x\arcsin(cx)}{7c^6} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2e}{3c^3} + \frac{3bde^2x\arcsin(cx)}{5c^4} + \frac{3(c^2x^2-1)^2be^3x\arcsin(cx)}{7c^6} + \frac{\sqrt{-c^2x^2+1}\,bd^2e}{c^3} + \frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,bde^2}{25c^5} + \frac{3(c^2x^2-1)be^3x\arcsin(cx)}{7c^6} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bde^2}{5c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}\,be^3}{49c^7} + \frac{be^3x\arcsin(cx)}{7c^6} + \frac{3\sqrt{-c^2x^2+1}\,bde^2}{5c^5} + \frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}\,be^3}{35c^7} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^3}{7c^7} + \frac{\sqrt{-c^2x^2+1}\,be^3}{7c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*e^3*x^7 + 3/5*a*d*e^2*x^5 + a*d^2*e*x^3 + b*d^3*x*arcsin(c*x) + a*d^3
*x + (c^2*x^2 - 1)*b*d^2*e*x*arcsin(c*x)/c^2 + b*d^2*e*x*arcsin(c*x)/c^2 +
3/5*(c^2*x^2 - 1)^2*b*d*e^2*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3/c
+ 6/5*(c^2*x^2 - 1)*b*d*e^2*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2 - 1)^3*b*e^3*x
*arcsin(c*x)/c^6 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^3 + 3/5*b*d*e^2*x*arc
sin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*e^3*x*arcsin(c*x)/c^6 + sqrt(-c^2*x^2
+ 1)*b*d^2*e/c^3 + 3/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^5 + 3/
```

```
7*(c^2*x^2 - 1)*b*e^3*x*arcsin(c*x)/c^6 - 2/5*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/
c^5 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3/c^7 + 1/7*b*e^3*x*arcsi
n(c*x)/c^6 + 3/5*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^5 + 3/35*(c^2*x^2 - 1)^2*sqrt
(-c^2*x^2 + 1)*b*e^3/c^7 - 1/7*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^7 + 1/7*sqrt(-c
^2*x^2 + 1)*b*e^3/c^7
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^3,x)
[Out] int((a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.619 $\int \frac{(d+ex^2)^3(a+b\text{ArcSin}(cx))}{x}\,dx$

Optimal. Leaf size=357

$$\frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{be^3x^5}{}$$

```
[Out] -3/4*b*d^2*e*arcsin(c*x)/c^2-9/32*b*d*e^2*arcsin(c*x)/c^4-5/96*b*e^3*arcsin
(c*x)/c^6-1/2*I*b*d^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+3/2*d^2*e*x^2
*(a+b*arcsin(c*x))+3/4*d*e^2*x^4*(a+b*arcsin(c*x))+1/6*e^3*x^6*(a+b*arcsin(
c*x))+b*d^3*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*d^3*arcsin(c*x
)*ln(x)+d^3*(a+b*arcsin(c*x))*ln(x)-1/2*I*b*d^3*arcsin(c*x)^2+3/4*b*d^2*e*x
*(-c^2*x^2+1)^(1/2)/c+9/32*b*d*e^2*x*(-c^2*x^2+1)^(1/2)/c^3+5/96*b*e^3*x*(-
c^2*x^2+1)^(1/2)/c^5+3/16*b*d*e^2*x^3*(-c^2*x^2+1)^(1/2)/c+5/144*b*e^3*x^3*
(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e^3*x^5*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.34, antiderivative size = 357, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.619$, Rules used = {272, 45, 4815, 12, 6874, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$d^3\log(x)(a+b\text{ArcSin}(cx))+\frac{3}{2}d^2ex^2(a+b\text{ArcSin}(cx))+\frac{3}{4}de^2x^4(a+b\text{ArcSin}(cx))+\frac{1}{6}e^3x^6(a+b\text{ArcSin}(cx))-\frac{5be^3\text{ArcSin}(cx)}{96c^6}-\frac{9bde^2\text{ArcSin}(cx)}{32c^4}-\frac{3bd^2e\text{ArcSin}(cx)}{4c^2}-\frac{1}{2}ibd^3\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{1}{2}ibd^3\text{ArcSin}(cx)^2+bd^3\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-bd^3\log(x)\text{ArcSin}(cx)+\frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{be^3x^5\sqrt{1-c^2x^2}}{36c}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (3*b*d^2*e*x*Sqrt[1 - c^2*x^2])/(4*c) + (9*b*d*e^2*x*Sqrt[1 - c^2*x^2])/(32
*c^3) + (5*b*e^3*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (3*b*d*e^2*x^3*Sqrt[1 - c^
2*x^2])/(16*c) + (5*b*e^3*x^3*Sqrt[1 - c^2*x^2])/(144*c^3) + (b*e^3*x^5*Sqr
t[1 - c^2*x^2])/(36*c) - (3*b*d^2*e*ArcSin[c*x])/(4*c^2) - (9*b*d*e^2*ArcSi
n[c*x])/(32*c^4) - (5*b*e^3*ArcSin[c*x])/(96*c^6) - (I/2)*b*d^3*ArcSin[c*x]
^2 + (3*d^2*e*x^2*(a + b*ArcSin[c*x]))/2 + (3*d*e^2*x^4*(a + b*ArcSin[c*x])
)/4 + (e^3*x^6*(a + b*ArcSin[c*x]))/6 + b*d^3*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] - b*d^3*ArcSin[c*x]*Log[x] + d^3*(a + b*ArcSin[c*x])*Log[x] -
 (I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{(d+ex^2)^3\,(a+b\sin^{-1}(cx))}{x}\,dx = \frac{3}{2}d^2ex^2\big(a+b\sin^{-1}(cx)\big)+\frac{3}{4}de^2x^4\big(a+b\sin^{-1}(cx)\big)+\frac{1}{6}e^3x^6\big(a+b\sin^{-1}$$

$$= \frac{3}{2}d^2ex^2\big(a+b\sin^{-1}(cx)\big)+\frac{3}{4}de^2x^4\big(a+b\sin^{-1}(cx)\big)+\frac{1}{6}e^3x^6\big(a+b\sin^{-1}$$

$$= \frac{3}{2}d^2ex^2\big(a+b\sin^{-1}(cx)\big)+\frac{3}{4}de^2x^4\big(a+b\sin^{-1}(cx)\big)+\frac{1}{6}e^3x^6\big(a+b\sin^{-1}$$

$$= \frac{3}{2}d^2ex^2\big(a+b\sin^{-1}(cx)\big)+\frac{3}{4}de^2x^4\big(a+b\sin^{-1}(cx)\big)+\frac{1}{6}e^3x^6\big(a+b\sin^{-1}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{be^3x^5\sqrt{1-c^2x^2}}{36c}+\frac{3}{2}d^2ex^2($$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{5be^3x^3}{}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3}{}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3}{}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3}{}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3}{}$$

Mathematica [A]
time = 0.33, size = 322, normalized size = 0.90

$$\frac{1}{12}\left(18ad^2ex^2+9ade^2x^4+2ae^3x^6+18bd^2ex^2\text{ArcSin}(cx)+9bde^2x^4\text{ArcSin}(cx)+2be^3x^6\text{ArcSin}(cx)+\frac{be^3\left(cx\sqrt{1-c^2x^2}\,(15+10c^2x^2+8c^4x^4)-30\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{24c^6}+\frac{9bde^2\left(cx\sqrt{1-c^2x^2}\,(3+2c^2x^2)-6\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{8c^4}+\frac{9bd^2e\left(cx\sqrt{1-c^2x^2}-2\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^2}+12bd^3\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)+12ad^3\log(x)-6ibd^3\left(\text{ArcSin}(cx)^2+\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (18*a*d^2*e*x^2 + 9*a*d*e^2*x^4 + 2*a*e^3*x^6 + 18*b*d^2*e*x^2*ArcSin[c*x]
+ 9*b*d*e^2*x^4*ArcSin[c*x] + 2*b*e^3*x^6*ArcSin[c*x] + (b*e^3*(c*x*Sqrt[1
- c^2*x^2]*(15 + 10*c^2*x^2 + 8*c^4*x^4) - 30*ArcTan[(c*x)/(-1 + Sqrt[1 - c
^2*x^2])]))/(24*c^6) + (9*b*d*e^2*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) -
6*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]))/(8*c^4) + (9*b*d^2*e*(c*x*Sqrt[1
 - c^2*x^2] - 2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]))/c^2 + 12*b*d^3*Arc
Sin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 12*a*d^3*Log[x] - (6*I)*b*d^3*(Ar
cSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])]))/12
```

Maple [A]
time = 0.28, size = 391, normalized size = 1.10

method	result
derivativedivides	$\frac{3a\,d^2e\,x^2}{2}+\frac{3ad\,e^2x^4}{4}+\frac{a\,e^3x^6}{6}+a\,d^3\ln\left(cx\right)-\frac{ib\,d^3\arcsin(cx)^2}{2}+b\,d^3\arcsin\left(cx\right)\ln\left(1-icx-\right.$
default	$\frac{3a\,d^2e\,x^2}{2}+\frac{3ad\,e^2x^4}{4}+\frac{a\,e^3x^6}{6}+a\,d^3\ln\left(cx\right)-\frac{ib\,d^3\arcsin(cx)^2}{2}+b\,d^3\arcsin\left(cx\right)\ln\left(1-icx-\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 3/2*a*d^2*e*x^2+3/4*a*d*e^2*x^4+1/6*a*e^3*x^6+a*d^3*ln(c*x)-I*b*d^3*polylog
(2,-I*c*x-(-c^2*x^2+1)^(1/2))+b*d^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/
2))+b*d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*b*d^3*polylog(2,I*c*
x+(-c^2*x^2+1)^(1/2))-1/2*I*b*d^3*arcsin(c*x)^2-1/192*b/c^6*arcsin(c*x)*e^3
*cos(6*arcsin(c*x))+1/1152*b/c^6*e^3*sin(6*arcsin(c*x))+3/32*b/c^4*cos(4*ar
csin(c*x))*arcsin(c*x)*d*e^2+1/32*b/c^6*cos(4*arcsin(c*x))*arcsin(c*x)*e^3-
3/128*b/c^4*sin(4*arcsin(c*x))*d*e^2-1/128*b/c^6*sin(4*arcsin(c*x))*e^3-3/4
*b/c^2*arcsin(c*x)*cos(2*arcsin(c*x))*d^2*e-3/8*b/c^4*arcsin(c*x)*cos(2*arc
sin(c*x))*d*e^2-5/64*b/c^6*arcsin(c*x)*cos(2*arcsin(c*x))*e^3+3/8*b/c^2*sin
(2*arcsin(c*x))*d^2*e+3/16*b/c^4*sin(2*arcsin(c*x))*d*e^2+5/128*b/c^6*sin(2
*arcsin(c*x))*e^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/6*a*x^6*e^3 + 3/4*a*d*x^4*e^2 + 3/2*a*d^2*x^2*e + a*d^3*log(x) + integrat
e((b*x^6*e^3 + 3*b*d*x^4*e^2 + 3*b*d^2*x^2*e + b*d^3)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*x^6*e^3 + 3*a*d*x^4*e^2 + 3*a*d^2*x^2*e + a*d^3 + (b*x^6*e^3 +
3*b*d*x^4*e^2 + 3*b*d^2*x^2*e + b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{asin}\,(cx))\,(d+ex^2)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**3/x, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x, x)
```

3.620 $\int \frac{(d+ex^2)^3(a+b\textbf{ArcSin}(cx))}{x^2}\,dx$

Optimal. Leaf size=190

$$\frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5}-\frac{be^2(5c^2d+2e)\left(1-c^2x^2\right)^{3/2}}{15c^5}+\frac{be^3\left(1-c^2x^2\right)^{5/2}}{25c^5}-\frac{d^3(a+b\text{ArcSin}(cx))}{x}$$

```
[Out] -1/15*b*e^2*(5*c^2*d+2*e)*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e^3*(-c^2*x^2+1)^(5
/2)/c^5-d^3*(a+b*arcsin(c*x))/x+3*d^2*e*x*(a+b*arcsin(c*x))+d*e^2*x^3*(a+b*
arcsin(c*x))+1/5*e^3*x^5*(a+b*arcsin(c*x))-b*c*d^3*arctanh((-c^2*x^2+1)^(1/
2))+1/5*b*e*(15*c^4*d^2+5*c^2*d*e+e^2)*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A]
time = 0.19, antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {276, 4815, 1813, 1634, 65, 214}

$$-\frac{d^3(a+b\text{ArcSin}(cx))}{x}+3d^2ex(a+b\text{ArcSin}(cx))+de^2x^3(a+b\text{ArcSin}(cx))+\frac{1}{5}e^3x^5(a+b\text{ArcSin}(cx))-bcd^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)-\frac{be^2\left(1-c^2x^2\right)^{3/2}(5c^2d+2e)}{15c^5}+\frac{be^3\left(1-c^2x^2\right)^{5/2}}{25c^5}+\frac{be\sqrt{1-c^2x^2}\,(15c^4d^2+5c^2de+e^2)}{5c^5}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*(15*c^4*d^2 + 5*c^2*d*e + e^2)*Sqrt[1 - c^2*x^2])/(5*c^5) - (b*e^2*(5*
c^2*d + 2*e)*(1 - c^2*x^2)^(3/2))/(15*c^5) + (b*e^3*(1 - c^2*x^2)^(5/2))/(2
5*c^5) - (d^3*(a + b*ArcSin[c*x]))/x + 3*d^2*e*x*(a + b*ArcSin[c*x]) + d*e^
2*x^3*(a + b*ArcSin[c*x]) + (e^3*x^5*(a + b*ArcSin[c*x]))/5 - b*c*d^3*ArcTa
nh[Sqrt[1 - c^2*x^2]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
```

```
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)^3\,(a+b\sin^{-1}(cx))}{x^2}\,dx = -\frac{d^3(a+b\sin^{-1}(cx))}{x} + 3d^2ex\left(a+b\sin^{-1}(cx)\right) + de^2x^3\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{x} + 3d^2ex\left(a+b\sin^{-1}(cx)\right) + de^2x^3\left(a+b\sin^{-1}(cx)\right)$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{x} + 3d^2ex\left(a+b\sin^{-1}(cx)\right) + de^2x^3\left(a+b\sin^{-1}(cx)\right)$$

$$= \frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2(5c^2d+2e)\,(1-c^2x^2)^{3/2}}{15c^5} + \frac{be}{}$$

$$= \frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2(5c^2d+2e)\,(1-c^2x^2)^{3/2}}{15c^5} + \frac{be}{}$$

$$= \frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2(5c^2d+2e)\,(1-c^2x^2)^{3/2}}{15c^5} + \frac{be}{}$$

Mathematica [A]

time = 0.14, size = 183, normalized size = 0.96

$$-\frac{ad^3}{x}+3ad^2ex+ade^2x^3+\frac{1}{5}ae^3x^5+\frac{be\sqrt{1-c^2x^2}\,(8e^2+2c^2e(25d+2ex^2)+c^4(225d^2+25dex^2+3e^2x^4))}{75c^5}+\frac{b(-5d^3+15d^2ex^2+5de^2x^4+e^3x^6)\operatorname{ArcSin}(cx)}{5x}+bcd^3\log(x)-bcd^3\log\left(1+\sqrt{1-c^2x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*d^3)/x) + 3*a*d^2*e*x + a*d*e^2*x^3 + (a*e^3*x^5)/5 + (b*e*Sqrt[1 - c^
2*x^2]*(8*e^2 + 2*c^2*e*(25*d + 2*e*x^2) + c^4*(225*d^2 + 25*d*e*x^2 + 3*e^
2*x^4)))/(75*c^5) + (b*(-5*d^3 + 15*d^2*e*x^2 + 5*d*e^2*x^4 + e^3*x^6)*ArcS
in[c*x])/(5*x) + b*c*d^3*Log[x] - b*c*d^3*Log[1 + Sqrt[1 - c^2*x^2]]
```

Maple [A]
time = 0.10, size = 264, normalized size = 1.39

method	result
derivativedivides	$c\left(\frac{a\left(3c^5d^2ex+c^5d\,e^2x^3+\frac{e^3c^5x^5}{5}-\frac{c^5d^3}{x}\right)}{c^6}+\frac{b\left(3\arcsin(cx)c^5d^2ex+\arcsin(cx)c^5d\,e^2x^3+\frac{\arcsin(cx)e^3c^5x^5}{5}-\frac{\arcsin(cx)\cdots}{x}\right.}{\cdots}\right.$
default	$c\left(\frac{a\left(3c^5d^2ex+c^5d\,e^2x^3+\frac{e^3c^5x^5}{5}-\frac{c^5d^3}{x}\right)}{c^6}+\frac{b\left(3\arcsin(cx)c^5d^2ex+\arcsin(cx)c^5d\,e^2x^3+\frac{\arcsin(cx)e^3c^5x^5}{5}-\frac{\arcsin(cx)\cdots}{x}\right.}{\cdots}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(a/c^6*(3*c^5*d^2*e*x+c^5*d*e^2*x^3+1/5*e^3*c^5*x^5-c^5*d^3/x)+b/c^6*(3*a
rcsin(c*x)*c^5*d^2*e*x+arcsin(c*x)*c^5*d*e^2*x^3+1/5*arcsin(c*x)*e^3*c^5*x^
5-arcsin(c*x)*c^5*d^3/x+3*c^4*d^2*e*(-c^2*x^2+1)^(1/2)-c^2*d*e^2*(-1/3*c^2*
x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-1/5*e^3*(-1/5*c^4*x^4*(-c^2*
x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-c^6*d
^3*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]
time = 0.48, size = 239, normalized size = 1.26

$$\frac{1}{5}\,ax^5e^3+adx^3e^2-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin\left(cx\right)}{x}\right)bd^3+3\,ad^2xe+\frac{1}{3}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2+\frac{3\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bd^2e}{c}-\frac{ad^3}{x}+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/5*a*x^5*e^3 + a*d*x^3*e^2 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)
) + arcsin(c*x)/x)*b*d^3 + 3*a*d^2*x*e + 1/3*(3*x^3*arcsin(c*x) + c*(sqrt(-
c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e^2 + 3*(c*x*arcsin(c
*x) + sqrt(-c^2*x^2 + 1))*b*d^2*e/c - a*d^3/x + 1/75*(15*x^5*arcsin(c*x) +
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c)*b*e^3
```

Fricas [A]
time = 2.32, size = 232, normalized size = 1.22

$$\frac{30\,ac^5x^6e^3 + 150\,ac^5dx^4e^2 - 75\,bc^6d^3x\log\left(\sqrt{-c^2x^2+1}+1\right) + 75\,bc^6d^3x\log\left(\sqrt{-c^2x^2+1}-1\right) + 450\,ac^5d^2x^2e - 150\,ac^5d^3 + 30\,(bc^5x^6e^3 + 5\,bc^5dx^4e^2 + 15\,bc^5d^2x^2e - 5\,bc^5d^3)\arcsin(cx) + 2\,(225\,bc^4d^2xe + (3\,bc^4x^5 + 4\,bc^2x^3 + 8\,bx)e^3 + 25\,(bc^4dx^3 + 2\,bc^2dx)e^2)\sqrt{-c^2x^2+1}}{150\,c^5x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/150*(30*a*c^5*x^6*e^3 + 150*a*c^5*d*x^4*e^2 - 75*b*c^6*d^3*x*log(sqrt(-c^
2*x^2 + 1) + 1) + 75*b*c^6*d^3*x*log(sqrt(-c^2*x^2 + 1) - 1) + 450*a*c^5*d^
2*x^2*e - 150*a*c^5*d^3 + 30*(b*c^5*x^6*e^3 + 5*b*c^5*d*x^4*e^2 + 15*b*c^5*
d^2*x^2*e - 5*b*c^5*d^3)*arcsin(c*x) + 2*(225*b*c^4*d^2*x*e + (3*b*c^4*x^5
+ 4*b*c^2*x^3 + 8*b*x)*e^3 + 25*(b*c^4*d*x^3 + 2*b*c^2*d*x)*e^2)*sqrt(-c^2*
x^2 + 1))/(c^5*x)
```

Sympy [A]
time = 4.71, size = 272, normalized size = 1.43

$$-\frac{ad^3}{x} + 3ad^2ex + ade^2x^3 + \frac{ae^3x^5}{5} + bcd^3\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - bcde^2\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right) - \frac{bce^3\left(\begin{cases} -\frac{x^4\sqrt{-c^2x^2+1}}{5c^2} - \frac{4x^2\sqrt{-c^2x^2+1}}{15c^4} - \frac{8\sqrt{-c^2x^2+1}}{15c^6} & \text{for}\ c \neq 0 \\ \frac{x^6}{6} & \text{otherwise} \end{cases}\right)}{5} - \frac{bd^3\operatorname{asin}(cx)}{x} + 3bd^2e\left(\begin{cases} 0 & \text{for}\ c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + bde^2x^3\operatorname{asin}(cx) + \frac{be^3x^5\operatorname{asin}(cx)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*x + a*d*e**2*x**3 + a*e**3*x**5/5 + b*c*d**3*Piecewi
se((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*
d*e**2*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 +
 1)/(3*c**4), Ne(c, 0)), (x**4/4, True)) - b*c*e**3*Piecewise((-x**4*sqrt(-
c**2*x**2 + 1)/(5*c**2) - 4*x**2*sqrt(-c**2*x**2 + 1)/(15*c**4) - 8*sqrt(-c
**2*x**2 + 1)/(15*c**6), Ne(c, 0)), (x**6/6, True))/5 - b*d**3*asin(c*x)/x
+ 3*b*d**2*e*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c
, True)) + b*d*e**2*x**3*asin(c*x) + b*e**3*x**5*asin(c*x)/5
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 10769 vs. $2(174) = 348$.
time = 11.48, size = 10769, normalized size = 56.68

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")

[Out] -1/2*b*c^18*d^3*x^12*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1/2*a*c^18*d^3*x^12/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) + b*c^17*d^3*x^11*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - b*c^17*d^3*x^11*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - 3*b*c^16*d^3*x^10*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) - 3*a*c^16*d^3*x^10/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) + 5*b*c^15*d^3*x^9*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 5*b*c^15*d^3*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 3*b*c^15*d^2*e*x^11/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 6*b*c^14*d^2*e*x^10*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) - 15/2*b*c^14*d^3*x^8*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1)

```
 + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^
2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 6*a*c^14*d^2*e*x^10/((c^16*x^11/
(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^10) - 15/2*a*c^14*d^3*x^8/((c^16*x^11/(sqrt(-c^2*x^2
 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-
c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)^8) + 10*b*c^13*d^3*x^7*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x
^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2
 + 1) + 1)^7) - 10*b*c^13*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(
sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^1
2*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sq
rt(-c^2*x^2 + 1) + 1)^7) - 2/3*b*c^13*d*e^2*x^11/((c^16*x^11/(sqrt(-c^2*x^2
 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-
c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)^11) - 9*b*c^13*d^2*e*x^9/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 +
 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sq...
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\operatorname{asin}(c\,x))\,\left(e\,x^2+d\right)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^2, x)
```

3.621 $\int \frac{(d+ex^2)^3(a+b\text{ArcSin}(cx))}{x^3}\,dx$

Optimal. Leaf size=262

$$-\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}-\frac{3be^2(8c^2d+e)\,\text{ArcSin}(cx)}{32c^4}-\frac{3}{2}ibd^2e\text{Arc}$$

```
[Out] -3/32*b*e^2*(8*c^2*d+e)*arcsin(c*x)/c^4-3/2*I*b*d^2*e*arcsin(c*x)^2-1/2*d^3
*(a+b*arcsin(c*x))/x^2+3/2*d*e^2*x^2*(a+b*arcsin(c*x))+1/4*e^3*x^4*(a+b*arc
sin(c*x))+3*b*d^2*e*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-3*b*d^2*
e*arcsin(c*x)*ln(x)+3*d^2*e*(a+b*arcsin(c*x))*ln(x)-3/2*I*b*d^2*e*polylog(2
,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d^3*(-c^2*x^2+1)^(1/2)/x+3/32*b*e^2*
(8*c^2*d+e)*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e^3*x^3*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.56, antiderivative size = 262, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 16, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.762$, Rules used = {272, 45, 4815, 12, 6874, 1821, 1598, 470, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$-\frac{d^3(a+b\text{ArcSin}(cx))}{2x^2}+3d^2e\log(x)(a+b\text{ArcSin}(cx))+\frac{3}{2}de^2x^2(a+b\text{ArcSin}(cx))+\frac{1}{4}e^3x^4(a+b\text{ArcSin}(cx))-\frac{3be^2\text{ArcSin}(cx)\,(8c^2d+e)}{32c^4}-\frac{3}{2}ibd^2e\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)-\frac{3}{2}ibd^2e\text{ArcSin}(cx)^2+3bd^2e\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right)-3bd^2e\log(x)\text{ArcSin}(cx)-\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}+\frac{3be^2x\sqrt{1-c^2x^2}\,(8c^2d+e)}{32c^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d^3*Sqrt[1 - c^2*x^2])/x + (3*b*e^2*(8*c^2*d + e)*x*Sqrt[1 - c^2*
x^2])/(32*c^3) + (b*e^3*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (3*b*e^2*(8*c^2*d +
 e)*ArcSin[c*x])/(32*c^4) - ((3*I)/2)*b*d^2*e*ArcSin[c*x]^2 - (d^3*(a + b*A
rcSin[c*x]))/(2*x^2) + (3*d*e^2*x^2*(a + b*ArcSin[c*x]))/2 + (e^3*x^4*(a +
b*ArcSin[c*x]))/4 + 3*b*d^2*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
3*b*d^2*e*ArcSin[c*x]*Log[x] + 3*d^2*e*(a + b*ArcSin[c*x])*Log[x] - ((3*I)/
2)*b*d^2*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1598

```
Int[(u_.)*(x_)^(m_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol]
 :> Int[u*x^(m + n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, m, p, q}, x]
&& IntegerQ[n] && PosQ[q - p]
```

Rule 1821

```
Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{
Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, S
imp[R*(c*x)^(m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] + Dist[1/(a*c*(
m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m
 + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ
[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\sin^{-1}(cx))}{x^3}\,dx = -\frac{d^3(a+b\sin^{-1}(cx))}{2x^2} + \frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right) + \frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx\right.$$
$$= -\frac{d^3(a+b\sin^{-1}(cx))}{2x^2} + \frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right) + \frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx\right.$$
$$= -\frac{d^3(a+b\sin^{-1}(cx))}{2x^2} + \frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right) + \frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx\right.$$
$$= -\frac{d^3(a+b\sin^{-1}(cx))}{2x^2} + \frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right) + \frac{1}{4}e^3x^4\left(a+b\sin^{-1}(cx\right.$$
$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} - \frac{d^3(a+b\sin^{-1}(cx))}{2x^2} + \frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right) + \frac{1}{4}$$
$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} - \frac{d^3(a+b\sin^{-1}(cx))}{2x^2} + \frac{3}{2}de^2x^2\left(a+b\sin^{-1}(cx)\right) + \frac{1}{4}$$
$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} - \frac{3}{2}ibd^2e\sin^{-1}(cx)^2 - \frac{d^3(a+b\sin}{2x}$$
$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} -$$
$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} -$$
$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} -$$

Mathematica [A]
time = 0.26, size = 262, normalized size = 1.00

$$\frac{1}{32}\left(-\frac{16ad^3}{x^2} + 48ade^2x^2 + 8ae^3x^4 - \frac{16bd^3\left(cx\sqrt{1-c^2x^2} + \text{ArcSin}(cx)\right)}{x^2} + \frac{be^3\left(cx\sqrt{1-c^2x^2}\,(3+2c^2x^2) + 8c^4x^4\text{ArcSin}(cx) - 6\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^4} + \frac{24bde^2\left(cx\sqrt{1-c^2x^2} + 2c^2x^2\text{ArcSin}(cx) - 2\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^2} + 96ad^2e\log(x) + 96bd^2e\left(\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right) - \frac{1}{2}i\left(\text{ArcSin}(cx)^2 + \text{PolyLog}\left(2, e^{2i\text{ArcSin}(cx)}\right)\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] ((-16*a*d^3)/x^2 + 48*a*d*e^2*x^2 + 8*a*e^3*x^4 - (16*b*d^3*(c*x*Sqrt[1 - c
^2*x^2] + ArcSin[c*x]))/x^2 + (b*e^3*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2)
 + 8*c^4*x^4*ArcSin[c*x] - 6*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]))/c^4 +
 (24*b*d*e^2*(c*x*Sqrt[1 - c^2*x^2] + 2*c^2*x^2*ArcSin[c*x] - 2*ArcTan[(c*x
)/(-1 + Sqrt[1 - c^2*x^2])]))/c^2 + 96*a*d^2*e*Log[x] + 96*b*d^2*e*(ArcSin[
c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*(ArcSin[c*x]^2 + PolyLog[2, E^(
(2*I)*ArcSin[c*x])])))/32
```

Maple [A]
time = 0.49, size = 396, normalized size = 1.51

method	result
derivativedivides	$c^2\left(\frac{3ad\,e^2x^2}{2c^2}+\frac{a\,e^3x^4}{4c^2}-\frac{a\,d^3}{2c^2x^2}+\frac{3a\,d^2e\ln(cx)}{c^2}+\frac{3bd\,e^2x\sqrt{-c^2x^2+1}}{4c^3}-\frac{3ib\,d^2e\,\mathrm{polylog}\left(2,-icx-\sqrt{-\right.}}{c^2}\right.$
default	$c^2\left(\frac{3ad\,e^2x^2}{2c^2}+\frac{a\,e^3x^4}{4c^2}-\frac{a\,d^3}{2c^2x^2}+\frac{3a\,d^2e\ln(cx)}{c^2}+\frac{3bd\,e^2x\sqrt{-c^2x^2+1}}{4c^3}-\frac{3ib\,d^2e\,\mathrm{polylog}\left(2,-icx-\sqrt{-\right.}}{c^2}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(3/2*a/c^2*d*e^2*x^2+1/4*a/c^2*e^3*x^4-1/2*a*d^3/c^2/x^2+3*a/c^2*d^2*e*
ln(c*x)+3/4*b*d*e^2*x*(-c^2*x^2+1)^(1/2)/c^3-3/2*I*b/c^2*arcsin(c*x)^2*d^2*
e-1/2*b*d^3/c/x*(-c^2*x^2+1)^(1/2)+1/8*b*e^3*x*(-c^2*x^2+1)^(1/2)/c^5-3/4*b
*d*e^2*arcsin(c*x)/c^4-1/128*b/c^6*sin(4*arcsin(c*x))*e^3+3*b/c^2*d^2*e*arc
sin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3*b/c^2*d^2*e*arcsin(c*x)*ln(1-I*c*
x-(-c^2*x^2+1)^(1/2))+1/2*I*d^3*b+1/4*b/c^4*arcsin(c*x)*e^3*x^2-1/8*b*e^3*a
rcsin(c*x)/c^6-1/2*b*arcsin(c*x)*d^3/c^2/x^2+3/2*b/c^2*arcsin(c*x)*d*e^2*x^
2+1/32*b/c^6*cos(4*arcsin(c*x))*arcsin(c*x)*e^3-3*I*b/c^2*d^2*e*polylog(2,-
I*c*x-(-c^2*x^2+1)^(1/2))-3*I*b/c^2*d^2*e*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4*e^3 - 1/2*b*d^3*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) + 3/2*
a*d*x^2*e^2 + 3*a*d^2*e*log(x) - 1/2*a*d^3/x^2 + integrate((b*x^4*e^3 + 3*b
*d*x^2*e^2 + 3*b*d^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*x^6*e^3 + 3*a*d*x^4*e^2 + 3*a*d^2*x^2*e + a*d^3 + (b*x^6*e^3 +
3*b*d*x^4*e^2 + 3*b*d^2*x^2*e + b*d^3)*arcsin(c*x))/x^3, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))(d + ex^2)^3}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**3/x**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))\,(e\,x^2 + d)^3}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^3, x)
```

3.622 $\int \frac{(d+ex^2)^3(a+b\mathbf{ArcSin}(cx))}{x^4}\,dx$

Optimal. Leaf size=186

$$\frac{be^2(9c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{be^3(1-c^2x^2)^{3/2}}{9c^3}-\frac{d^3(a+b\text{ArcSin}(cx))}{3x^3}-\frac{3d^2e(a+b\text{ArcSin}(cx}{x}$$

```
[Out] -1/9*b*e^3*(-c^2*x^2+1)^(3/2)/c^3-1/3*d^3*(a+b*arcsin(c*x))/x^3-3*d^2*e*(a+
b*arcsin(c*x))/x+3*d*e^2*x*(a+b*arcsin(c*x))+1/3*e^3*x^3*(a+b*arcsin(c*x))-
1/6*b*c*d^2*(c^2*d+18*e)*arctanh((-c^2*x^2+1)^(1/2))+1/3*b*e^2*(9*c^2*d+e)*
(-c^2*x^2+1)^(1/2)/c^3-1/6*b*c*d^3*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A]
time = 0.23, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$, Rules used = {276, 4815, 12, 1813, 1635, 911, 1167, 214}

$$-\frac{d^3(a+b\text{ArcSin}(cx))}{3x^3}-\frac{3d^2e(a+b\text{ArcSin}(cx))}{x}+3de^2x(a+b\text{ArcSin}(cx))+\frac{1}{3}e^3x^3(a+b\text{ArcSin}(cx))-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{1}{6}bcd^2(c^2d+18e)\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)+\frac{be^2\sqrt{1-c^2x^2}(9c^2d+e)}{3c^3}-\frac{be^3(1-c^2x^2)^{3/2}}{9c^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*e^2*(9*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*c*d^3*Sqrt[1 - c^2*x^2
])/(6*x^2) - (b*e^3*(1 - c^2*x^2)^(3/2))/(9*c^3) - (d^3*(a + b*ArcSin[c*x])
)/(3*x^3) - (3*d^2*e*(a + b*ArcSin[c*x]))/x + 3*d*e^2*x*(a + b*ArcSin[c*x])
 + (e^3*x^3*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(c^2*d + 18*e)*ArcTanh[Sqrt[1
 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1635

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :
> With[{Qx = PolynomialQuotient[Px, a + b*x, x], R = PolynomialRemainder[Px
, a + b*x, x]}, Simp[R*(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((m + 1)*(b*c -
 a*d))), x] + Dist[1/((m + 1)*(b*c - a*d)), Int[(a + b*x)^(m + 1)*(c + d*x)
^n*ExpandToSum[(m + 1)*(b*c - a*d)*Qx - d*R*(m + n + 2), x], x], x]] /; Fre
eQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[m, -1] && GtQ[Expon[Px, x],
2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\sin^{-1}(cx))}{x^4} dx = -\frac{d^3(a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e(a+b\sin^{-1}(cx))}{x} + 3de^2x(a+b\sin^{-1}(cx)$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e(a+b\sin^{-1}(cx))}{x} + 3de^2x(a+b\sin^{-1}(cx)$$

$$= -\frac{d^3(a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e(a+b\sin^{-1}(cx))}{x} + 3de^2x(a+b\sin^{-1}(cx)$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3(a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e(a+b\sin^{-1}(cx))}{x} + 3d$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3(a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e(a+b\sin^{-1}(cx))}{x} + 3d$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3(a+b\sin^{-1}(cx))}{3x^3} - \frac{3d^2e(a+b\sin^{-1}(cx))}{x} + 3d$$

$$= \frac{be^2(9c^2d+e)\sqrt{1-c^2x^2}}{3c^3} - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{be^3(1-c^2x^2)^{3/2}}{9c^3} - d^3($$

$$= \frac{be^2(9c^2d+e)\sqrt{1-c^2x^2}}{3c^3} - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{be^3(1-c^2x^2)^{3/2}}{9c^3} - d^3($$

Mathematica [A]
time = 0.18, size = 194, normalized size = 1.04

$$\frac{1}{6}\left(-\frac{2ad^3}{x^3} - \frac{18ad^2e}{x} + 18ade^2x + 2ae^3x^3 + \frac{b\sqrt{1-c^2x^2}\,(-3c^4d^3+4e^3x^2+2c^2e^2x^2(27d+ex^2))}{3c^3x^2} + \frac{2b(-d^3-9d^2ex^2+9de^2x^4+e^3x^6)\,\mathrm{ArcSin}(cx)}{x^3} + bcd^2(c^2d+18e)\log(x) - bcd^2(c^2d+18e)\log\left(1+\sqrt{1-c^2x^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^3)/x^3 - (18*a*d^2*e)/x + 18*a*d*e^2*x + 2*a*e^3*x^3 + (b*Sqrt[1 -
 c^2*x^2]*(-3*c^4*d^3 + 4*e^3*x^2 + 2*c^2*e^2*x^2*(27*d + e*x^2)))/(3*c^3*x
^2) + (2*b*(-d^3 - 9*d^2*e*x^2 + 9*d*e^2*x^4 + e^3*x^6)*ArcSin[c*x])/x^3 +
b*c*d^2*(c^2*d + 18*e)*Log[x] - b*c*d^2*(c^2*d + 18*e)*Log[1 + Sqrt[1 - c^2
*x^2]])/6
```

Maple [A]
time = 0.10, size = 249, normalized size = 1.34

method	result

derivativedivides	$c^3\left(\frac{a\left(3c^3d\,e^2x+\frac{e^3c^3x^3}{3}-\frac{c^3d^3}{3x^3}-\frac{3c^3d^2e}{x}\right)}{c^6}+\frac{b\left(3\arcsin(cx)c^3d\,e^2x+\frac{\arcsin(cx)e^3c^3x^3}{3}-\frac{\arcsin(cx)c^3d^3}{3x^3}-\frac{3\arcsin(cx)c^3d^2e}{x}\right.}{}\right.$
default	$c^3\left(\frac{a\left(3c^3d\,e^2x+\frac{e^3c^3x^3}{3}-\frac{c^3d^3}{3x^3}-\frac{3c^3d^2e}{x}\right)}{c^6}+\frac{b\left(3\arcsin(cx)c^3d\,e^2x+\frac{\arcsin(cx)e^3c^3x^3}{3}-\frac{\arcsin(cx)c^3d^3}{3x^3}-\frac{3\arcsin(cx)c^3d^2e}{x}\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(a/c^6*(3*c^3*d*e^2*x+1/3*e^3*c^3*x^3-1/3*c^3*d^3/x^3-3*c^3*d^2*e/x)+b/
c^6*(3*arcsin(c*x)*c^3*d*e^2*x+1/3*arcsin(c*x)*e^3*c^3*x^3-1/3*arcsin(c*x)*
c^3*d^3/x^3-3*arcsin(c*x)*c^3*d^2*e/x+3*c^2*d*e^2*(-c^2*x^2+1)^(1/2)-1/3*e^
3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+1/3*c^6*d^3*(-1/
2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*arctanh(1/(-c^2*x^2+1)^(1/2)))-3*c^4*d^2*e
*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Maxima [A]

time = 0.50, size = 229, normalized size = 1.23

$$-\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd^3+\frac{1}{3}ax^3e^3-3\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd^2e+3adxe^2+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^3+\frac{3\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bde^2}{c}-\frac{3ad^2e}{x}-\frac{ad^3}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)
/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^3 + 1/3*a*x^3*e^3 - 3*(c*log(2*sqrt(-c^2*x
^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d^2*e + 3*a*d*x*e^2 + 1/9*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)
)*b*e^3 + 3*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*e^2/c - 3*a*d^2*e/x
- 1/3*a*d^3/x^3
```

Fricas [A]
time = 1.90, size = 249, normalized size = 1.34

$$\frac{12\,ac^3x^6e^3 + 108\,ac^3dx^4e^2 - 108\,ac^3d^2x^2e - 12\,ac^3d^3 + 12\,(bc^3x^6e^3 + 9\,bc^3dx^4e^2 - 9\,bc^3d^2x^2e - bc^3d^3)\arcsin(cx) - 3\,(bc^6d^3x^3 + 18\,bc^4d^2x^3e)\log\left(\sqrt{-c^2x^2+1}+1\right) + 3\,(bc^6d^3x^3 + 18\,bc^4d^2x^3e)\log\left(\sqrt{-c^2x^2+1}-1\right) - 2\,(3\,bc^4d^3x - 54\,bc^2dx^3e^2 - 2\,(bc^2x^5 + 2\,bx^3)e^3)\sqrt{-c^2x^2+1}}{36\,c^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/36*(12*a*c^3*x^6*e^3 + 108*a*c^3*d*x^4*e^2 - 108*a*c^3*d^2*x^2*e - 12*a*c
^3*d^3 + 12*(b*c^3*x^6*e^3 + 9*b*c^3*d*x^4*e^2 - 9*b*c^3*d^2*x^2*e - b*c^3*
d^3)*arcsin(c*x) - 3*(b*c^6*d^3*x^3 + 18*b*c^4*d^2*x^3*e)*log(sqrt(-c^2*x^2
 + 1) + 1) + 3*(b*c^6*d^3*x^3 + 18*b*c^4*d^2*x^3*e)*log(sqrt(-c^2*x^2 + 1)
- 1) - 2*(3*b*c^4*d^3*x - 54*b*c^2*d*x^3*e^2 - 2*(b*c^2*x^5 + 2*b*x^3)*e^3)
*sqrt(-c^2*x^2 + 1))/(c^3*x^3)
```

Sympy [A]
time = 5.78, size = 309, normalized size = 1.66

$$-\frac{ad^3}{3x^3} - \frac{3ad^2e}{x} + 3ade^2x + \frac{ae^3x^3}{3} + \frac{bcd^3\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} + \frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}} - \frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise} \end{cases}\right)}{3} + 3bcd^2e\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bce^3\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3} - \frac{bd^3\operatorname{asin}(cx)}{3x^3} - \frac{3bd^2e\operatorname{asin}(cx)}{x} + 3bde^2\left(\begin{cases} 0 & \text{for}\ c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + \frac{be^3x^3\operatorname{asin}(cx)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) - 3*a*d**2*e/x + 3*a*d*e**2*x + a*e**3*x**3/3 + b*c*d**3*P
iecewise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*
c*x**3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*
x))/2 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), True))/3 + 3*b*c*d**2*e*Piecewis
e((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*e
**3*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)
/(3*c**4), Ne(c, 0)), (x**4/4, True))/3 - b*d**3*asin(c*x)/(3*x**3) - 3*b*d
**2*e*asin(c*x)/x + 3*b*d*e**2*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt
(-c**2*x**2 + 1)/c, True)) + b*e**3*x**3*asin(c*x)/3
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 7971 vs. $2(166) = 332$.

time = 8.06, size = 7971, normalized size = 42.85

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^18*d^3*x^12*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3
*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1/24*
a*c^18*d^3*x^12/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c
^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^12) + 1/24*b*c^17*d^3*x^11/((
c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3)*(sqrt(-c^2*x^2 + 1) + 1)^11) - 1/4*b*c^16*d^3*x^10*arcsin(c*x)/((c^12*x^
9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqr
t(-c^2*x^2 + 1) + 1)^10) - 1/4*a*c^16*d^3*x^10/((c^12*x^9/(sqrt(-c^2*x^2 +
1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1
)^10) + 1/6*b*c^15*d^3*x^9*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c^2*x^2 + 1
) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2
 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)
^9) - 1/6*b*c^15*d^3*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^12*x^9/(sqrt(-c^2*
x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
1) + 1)^9) + 1/8*b*c^15*d^3*x^9/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c
^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
 c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^9) - 3/2*b*c^
14*d^2*e*x^10*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^
7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x
^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^10) - 5/8*b*c^14*d^
3*x^8*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt
(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 3/2*a*c^14*d^2*e*x^10/
((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)
^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1
)^3)*(sqrt(-c^2*x^2 + 1) + 1)^10) - 5/8*a*c^14*d^3*x^8/((c^12*x^9/(sqrt(-c^
2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
+ 1) + 1)^8) + 3*b*c^13*d^2*e*x^9*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c^2*
x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
1) + 1)^9) + 1/2*b*c^13*d^3*x^7*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c^2*x^
```

```
2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1)
 + 1)^7) - 3*b*c^13*d^2*e*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^12*x^9/(sqrt(
-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(s
qrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x
^2 + 1) + 1)^9) - 1/2*b*c^13*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^12*x^9
/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt
(-c^2*x^2 + 1) + 1)^7) + 1/12*b*c^13*d^3*x^7/((c^12*x^9/(sqrt(-c^2*x^2 + 1)
 + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2
+ 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^
7) - 6*b*c^12*d^2*e*x^8*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)
^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 5/6*
b*c^12*d^3*x^6*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x
^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*
x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 6*a*c^12*d^2*
e*x^8/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1
) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 5/6*a*c^12*d^3*x^6/((c^12*x^9/(sqr
t(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2
*x^2 + 1) + 1)^6) + 9*b*c^11*d^2*e*x^7*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(
-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(s
qrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x
^2 + 1) + 1)^7) + 1/2*b*c^11*d^3*x^5*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^5) - 9*b*c^11*d^2*e*x^7*log(sqrt(-c^...
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^4, x)
```

3.623 $\int (d+ex^2)^4 (a+b\text{ArcSin}(cx))\,dx$

Optimal. Leaf size=317

$$\frac{b(315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4)\sqrt{1-c^2x^2}}{315c^9}-\frac{4be(105c^6d^3+189c^4d^2e+135c^2de^2+35$$

```
[Out] -4/945*b*e*(105*c^6*d^3+189*c^4*d^2*e+135*c^2*d*e^2+35*e^3)*(-c^2*x^2+1)^(3
/2)/c^9+2/525*b*e^2*(63*c^4*d^2+90*c^2*d*e+35*e^2)*(-c^2*x^2+1)^(5/2)/c^9-4
/441*b*e^3*(9*c^2*d+7*e)*(-c^2*x^2+1)^(7/2)/c^9+1/81*b*e^4*(-c^2*x^2+1)^(9/
2)/c^9+d^4*x*(a+b*arcsin(c*x))+4/3*d^3*e*x^3*(a+b*arcsin(c*x))+6/5*d^2*e^2*
x^5*(a+b*arcsin(c*x))+4/7*d*e^3*x^7*(a+b*arcsin(c*x))+1/9*e^4*x^9*(a+b*arcs
in(c*x))+1/315*b*(315*c^8*d^4+420*c^6*d^3*e+378*c^4*d^2*e^2+180*c^2*d*e^3+3
5*e^4)*(-c^2*x^2+1)^(1/2)/c^9
```

Rubi [A]
time = 0.24, antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.278$, Rules used = {200, 4755, 12, 1813, 1864}

$$d^4x(a+b\text{ArcSin}(cx))+\frac{4}{3}d^3ex^3(a+b\text{ArcSin}(cx))+\frac{6}{5}d^2e^2x^5(a+b\text{ArcSin}(cx))+\frac{4}{7}de^3x^7(a+b\text{ArcSin}(cx))+\frac{1}{9}e^4x^9(a+b\text{ArcSin}(cx))-\frac{4be^3(1-c^2x^2)^{7/2}(9c^2d+7e)}{441c^9}+\frac{be^4(1-c^2x^2)^{9/2}}{81c^9}+\frac{2be^2(1-c^2x^2)^{5/2}(63c^4d^2+90c^2de+35e^2)}{525c^9}-\frac{4be(1-c^2x^2)^{3/2}(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)}{945c^9}+\frac{b\sqrt{1-c^2x^2}(315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4)}{315c^9}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^4*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(315*c^8*d^4 + 420*c^6*d^3*e + 378*c^4*d^2*e^2 + 180*c^2*d*e^3 + 35*e^4)
*Sqrt[1 - c^2*x^2])/(315*c^9) - (4*b*e*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c
^2*d*e^2 + 35*e^3)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (2*b*e^2*(63*c^4*d^2 +
90*c^2*d*e + 35*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (4*b*e^3*(9*c^2*d + 7
*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^4*(1 - c^2*x^2)^(9/2))/(81*c^9) +
 d^4*x*(a + b*ArcSin[c*x]) + (4*d^3*e*x^3*(a + b*ArcSin[c*x]))/3 + (6*d^2*e
^2*x^5*(a + b*ArcSin[c*x]))/5 + (4*d*e^3*x^7*(a + b*ArcSin[c*x]))/7 + (e^4*
x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\int \left(d+ex^2\right)^4 \left(a+b\sin^{-1}(cx)\right)\,dx = d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}\right.$$
$$= d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}\right.$$
$$= d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}\right.$$
$$= d^4x\left(a+b\sin^{-1}(cx)\right)+\frac{4}{3}d^3ex^3\left(a+b\sin^{-1}(cx)\right)+\frac{6}{5}d^2e^2x^5\left(a+b\sin^{-1}\right.$$
$$= \frac{b\left(315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4\right)\sqrt{1-c^2x^2}}{315c^9}-$$

Mathematica [A]
time = 0.17, size = 260, normalized size = 0.82

$$\frac{315ax(315d^4+420d^3ex^2+378d^2e^2x^4+180de^3x^6+35e^4x^8)+\frac{b\sqrt{1-c^2x^2}\left(4480e^4+320c^2e^3(81d+7ex^2)+48c^4e^2(1323d^2+270dex^2+35e^2x^4)+8c^6e(11025d^3+3969d^2ex^2+1215de^2x^4+175e^3x^6)+c^8(99225d^4+44100d^3ex^2+23814d^2e^2x^4+8100de^3x^6+1225e^4x^8)\right)}{c^9}+315bx(315d^4+420d^3ex^2+378d^2e^2x^4+180de^3x^6+35e^4x^8)\,\mathrm{ArcSin}(cx)}{99225}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^4*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x*(315*d^4 + 420*d^3*e*x^2 + 378*d^2*e^2*x^4 + 180*d*e^3*x^6 + 35*e^
4*x^8) + (b*Sqrt[1 - c^2*x^2]*(4480*e^4 + 320*c^2*e^3*(81*d + 7*e*x^2) + 48
```

```
*c^4*e^2*(1323*d^2 + 270*d*e*x^2 + 35*e^2*x^4) + 8*c^6*e*(11025*d^3 + 3969*
d^2*e*x^2 + 1215*d*e^2*x^4 + 175*e^3*x^6) + c^8*(99225*d^4 + 44100*d^3*e*x^
2 + 23814*d^2*e^2*x^4 + 8100*d*e^3*x^6 + 1225*e^4*x^8)))/c^9 + 315*b*x*(315
*d^4 + 420*d^3*e*x^2 + 378*d^2*e^2*x^4 + 180*d*e^3*x^6 + 35*e^4*x^8)*ArcSin
[c*x])/99225
```

Maple [A]
time = 0.10, size = 465, normalized size = 1.47

method	result
derivativedivides	$\frac{a\left(c^9 d^4 x+\frac{4}{3} c^9 d^3 e\, x^3+\frac{6}{5} c^9 d^2 e^2 x^5+\frac{4}{7} d\, c^9 e^3 x^7+\frac{1}{9} e^4 c^9 x^9\right)}{c^8}+ \frac{b\left(\arcsin(cx) c^9 d^4 x+\frac{4 \arcsin(cx) c^9 d^3 e\, x^3}{3}+\frac{6 \arcsin(cx) c^9 d^2 e^2 x^5}{5}+\frac{4 \operatorname{arcs}\ldots\right.}{\ldots}$
default	$\frac{a\left(c^9 d^4 x+\frac{4}{3} c^9 d^3 e\, x^3+\frac{6}{5} c^9 d^2 e^2 x^5+\frac{4}{7} d\, c^9 e^3 x^7+\frac{1}{9} e^4 c^9 x^9\right)}{c^8}+ \frac{b\left(\arcsin(cx) c^9 d^4 x+\frac{4 \arcsin(cx) c^9 d^3 e\, x^3}{3}+\frac{6 \arcsin(cx) c^9 d^2 e^2 x^5}{5}+\frac{4 \operatorname{arcs}\ldots\right.}{\ldots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^4*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/c^8*(c^9*d^4*x+4/3*c^9*d^3*e*x^3+6/5*c^9*d^2*e^2*x^5+4/7*d*c^9*e^3*x
^7+1/9*e^4*c^9*x^9)+b/c^8*(arcsin(c*x)*c^9*d^4*x+4/3*arcsin(c*x)*c^9*d^3*e*
x^3+6/5*arcsin(c*x)*c^9*d^2*e^2*x^5+4/7*arcsin(c*x)*d*c^9*e^3*x^7+1/9*arcsi
n(c*x)*e^4*c^9*x^9+c^8*d^4*(-c^2*x^2+1)^(1/2)-4/3*c^6*d^3*e*(-1/3*c^2*x^2*(
-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-6/5*c^4*d^2*e^2*(-1/5*c^4*x^4*(-c
^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-4/
7*d*c^2*e^3*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2
)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-1/9*e^4*(-1/9*c
^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*x^4*(-
c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+1)^(1/
2))))
```

Maxima [A]
time = 0.48, size = 420, normalized size = 1.32

$$\frac{1}{9} a x^9 e^4 + \frac{4}{7} a d x^7 e^3 + \frac{6}{5} a d^2 x^5 e^2 + \frac{4}{3} a d^3 x^3 e + a d^4 x + \frac{4}{9}\left(3 x^3 \arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right) b d^3 e + \frac{\left(cx \arcsin(cx) + \sqrt{-c^2x^2+1}\right) b d^4}{c} + \frac{2}{25}\left(15 x^5 \arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right) b d^2 e^2 + \frac{4}{245}\left(35 x^7 \arcsin(cx) + \left(\frac{5\sqrt{-c^2x^2+1}\,x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}\,x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}\,x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right) b d e^3 + \frac{1}{2835}\left(315 x^9 \arcsin(cx) + \left(\frac{35\sqrt{-c^2x^2+1}\,x^8}{c^2} + \frac{40\sqrt{-c^2x^2+1}\,x^6}{c^4} + \frac{48\sqrt{-c^2x^2+1}\,x^4}{c^6} + \frac{64\sqrt{-c^2x^2+1}\,x^2}{c^8} + \frac{128\sqrt{-c^2x^2+1}}{c^{10}}\right)c\right) b e^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*x^9*e^4 + 4/7*a*d*x^7*e^3 + 6/5*a*d^2*x^5*e^2 + 4/3*a*d^3*x^3*e + a*d
^4*x + 4/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2
```

```
*x^2 + 1)/c^4))*b*d^3*e + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^4/c +
2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2
+ 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^2*e^2 + 4/245*(35*x^7*arcsi
n(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*s
qrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d*e^3 + 1/2835*
(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 +
1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8
+ 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*e^4
```

Fricas [**A**]
time = 2.30, size = 307, normalized size = 0.97

$$\frac{11025\,ac^9x^9e^4+56700\,ac^9dx^7e^3+119070\,ac^9d^2x^5e^2+132300\,ac^9d^3x^3e+99225\,ac^9d^4x+315\,(35\,bc^9x^9e^4+180\,bc^9dx^7e^3+378\,bc^9d^2x^5e^2+420\,bc^9d^3x^3e+315\,bc^9d^4x)\arcsin(cx)+(99225\,bc^8d^4+35\,(35\,bc^8x^8+40\,bc^6x^6+48\,bc^4x^4+64\,bc^2x^2+128\,b)e^4+1620\,(5\,bc^8dx^6+6\,bc^6dx^4+8\,bc^4dx^2+16\,bc^2d)e^3+7938\,(3\,bc^8d^2x^4+4\,bc^6d^2x^2+8\,bc^4d^2)e^2+44100\,(bc^8d^3x^2+2\,bc^6d^3)e)\sqrt{-c^2x^2+1}}{99225\,c^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*x^9*e^4 + 56700*a*c^9*d*x^7*e^3 + 119070*a*c^9*d^2*x^5
*e^2 + 132300*a*c^9*d^3*x^3*e + 99225*a*c^9*d^4*x + 315*(35*b*c^9*x^9*e^4 +
 180*b*c^9*d*x^7*e^3 + 378*b*c^9*d^2*x^5*e^2 + 420*b*c^9*d^3*x^3*e + 315*b*
c^9*d^4*x)*arcsin(c*x) + (99225*b*c^8*d^4 + 35*(35*b*c^8*x^8 + 40*b*c^6*x^6
 + 48*b*c^4*x^4 + 64*b*c^2*x^2 + 128*b)*e^4 + 1620*(5*b*c^8*d*x^6 + 6*b*c^6
*d*x^4 + 8*b*c^4*d*x^2 + 16*b*c^2*d)*e^3 + 7938*(3*b*c^8*d^2*x^4 + 4*b*c^6*
d^2*x^2 + 8*b*c^4*d^2)*e^2 + 44100*(b*c^8*d^3*x^2 + 2*b*c^6*d^3)*e)*sqrt(-c
^2*x^2 + 1))/c^9
```

Sympy [**A**]
time = 1.57, size = 593, normalized size = 1.87

$$\begin{cases} ad^4x+\frac{4ad^3ex^3}{3}+\frac{6ad^2e^2x^5}{5}+\frac{4ade^3x^7}{7}+\frac{ae^4x^9}{9}+bd^4x\,\mathrm{asin}(cx)+\frac{4bd^3ex^3\,\mathrm{asin}(cx)}{3}+\frac{6bd^2e^2x^5\,\mathrm{asin}(cx)}{5}+\frac{4bde^3x^7\,\mathrm{asin}(cx)}{7}+\frac{be^4x^9\,\mathrm{asin}(cx)}{9}+\frac{bd^4\sqrt{-c^2x^2+1}}{c}+\frac{4bd^3ex^2\sqrt{-c^2x^2+1}}{9c}+\frac{6bd^2e^2x^4\sqrt{-c^2x^2+1}}{25c}+\frac{4bde^3x^6\sqrt{-c^2x^2+1}}{49c}+\frac{be^4x^8\sqrt{-c^2x^2+1}}{81c}+\frac{8bd^3e\sqrt{-c^2x^2+1}}{9c^3}+\frac{8bd^2e^2x^2\sqrt{-c^2x^2+1}}{25c^3}+\frac{24bde^3x^4\sqrt{-c^2x^2+1}}{245c^3}+\frac{8be^4x^6\sqrt{-c^2x^2+1}}{567c^3}+\frac{16bd^2e^2\sqrt{-c^2x^2+1}}{25c^5}+\frac{32bde^3x^2\sqrt{-c^2x^2+1}}{245c^5}+\frac{16be^4x^4\sqrt{-c^2x^2+1}}{945c^5}+\frac{64bde^3\sqrt{-c^2x^2+1}}{245c^7}+\frac{64be^4x^2\sqrt{-c^2x^2+1}}{2835c^7}+\frac{128be^4\sqrt{-c^2x^2+1}}{2835c^9} & \text{for}\ c\neq 0 \\ a\left(d^4x+\frac{4d^3ex^3}{3}+\frac{6d^2e^2x^5}{5}+\frac{4de^3x^7}{7}+\frac{e^4x^9}{9}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**4*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**4*x + 4*a*d**3*e*x**3/3 + 6*a*d**2*e**2*x**5/5 + 4*a*d*e**3
*x**7/7 + a*e**4*x**9/9 + b*d**4*x*asin(c*x) + 4*b*d**3*e*x**3*asin(c*x)/3
+ 6*b*d**2*e**2*x**5*asin(c*x)/5 + 4*b*d*e**3*x**7*asin(c*x)/7 + b*e**4*x**
9*asin(c*x)/9 + b*d**4*sqrt(-c**2*x**2 + 1)/c + 4*b*d**3*e*x**2*sqrt(-c**2*
x**2 + 1)/(9*c) + 6*b*d**2*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 4*b*d*e*
*3*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b*e**4*x**8*sqrt(-c**2*x**2 + 1)/(81*
c) + 8*b*d**3*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + 8*b*d**2*e**2*x**2*sqrt(-c*
*2*x**2 + 1)/(25*c**3) + 24*b*d*e**3*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) +
 8*b*e**4*x**6*sqrt(-c**2*x**2 + 1)/(567*c**3) + 16*b*d**2*e**2*sqrt(-c**2*
x**2 + 1)/(25*c**5) + 32*b*d*e**3*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16
*b*e**4*x**4*sqrt(-c**2*x**2 + 1)/(945*c**5) + 64*b*d*e**3*sqrt(-c**2*x**2
+ 1)/(245*c**7) + 64*b*e**4*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e
```

```
**4*sqrt(-c**2*x**2 + 1)/(2835*c**9), Ne(c, 0)), (a*(d**4*x + 4*d**3*e*x**3
/3 + 6*d**2*e**2*x**5/5 + 4*d*e**3*x**7/7 + e**4*x**9/9), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 766 vs. 2(289) = 578.
time = 0.42, size = 766, normalized size = 2.42

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*e^4*x^9 + 4/7*a*d*e^3*x^7 + 6/5*a*d^2*e^2*x^5 + 4/3*a*d^3*e*x^3 + b*d
^4*x*arcsin(c*x) + a*d^4*x + 4/3*(c^2*x^2 - 1)*b*d^3*e*x*arcsin(c*x)/c^2 +
4/3*b*d^3*e*x*arcsin(c*x)/c^2 + 6/5*(c^2*x^2 - 1)^2*b*d^2*e^2*x*arcsin(c*x)
/c^4 + sqrt(-c^2*x^2 + 1)*b*d^4/c + 12/5*(c^2*x^2 - 1)*b*d^2*e^2*x*arcsin(c
*x)/c^4 + 4/7*(c^2*x^2 - 1)^3*b*d*e^3*x*arcsin(c*x)/c^6 - 4/9*(-c^2*x^2 + 1
)^(3/2)*b*d^3*e/c^3 + 6/5*b*d^2*e^2*x*arcsin(c*x)/c^4 + 12/7*(c^2*x^2 - 1)^
2*b*d*e^3*x*arcsin(c*x)/c^6 + 1/9*(c^2*x^2 - 1)^4*b*e^4*x*arcsin(c*x)/c^8 +
 4/3*sqrt(-c^2*x^2 + 1)*b*d^3*e/c^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 +
1)*b*d^2*e^2/c^5 + 12/7*(c^2*x^2 - 1)*b*d*e^3*x*arcsin(c*x)/c^6 + 4/9*(c^2*
x^2 - 1)^3*b*e^4*x*arcsin(c*x)/c^8 - 4/5*(-c^2*x^2 + 1)^(3/2)*b*d^2*e^2/c^5
 + 4/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^3/c^7 + 4/7*b*d*e^3*x*arcs
in(c*x)/c^6 + 2/3*(c^2*x^2 - 1)^2*b*e^4*x*arcsin(c*x)/c^8 + 6/5*sqrt(-c^2*x
^2 + 1)*b*d^2*e^2/c^5 + 12/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^3/c^
7 + 1/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^4/c^9 + 4/9*(c^2*x^2 - 1)*b
*e^4*x*arcsin(c*x)/c^8 - 4/7*(-c^2*x^2 + 1)^(3/2)*b*d*e^3/c^7 + 4/63*(c^2*x
^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^4/c^9 + 1/9*b*e^4*x*arcsin(c*x)/c^8 + 4/7*
sqrt(-c^2*x^2 + 1)*b*d*e^3/c^7 + 2/15*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*
e^4/c^9 - 4/27*(-c^2*x^2 + 1)^(3/2)*b*e^4/c^9 + 1/9*sqrt(-c^2*x^2 + 1)*b*e^
4/c^9
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{asin}(c\,x))\,\left(e\,x^2 + d\right)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^4,x)
```

```
[Out] int((a + b*asin(c*x))*(d + e*x^2)^4, x)
```

3.624 $\int \frac{x^4(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=653

$$-\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}-\frac{b(1-c^2x^2)^{3/2}}{9c^3e}-\frac{bdx\text{ArcSin}(cx)}{e^2}+\frac{x^3(a+b\text{ArcSin}(cx))}{3e}+\frac{(-d)^{3/2}(a+}{}$$

[Out] -a*d*x/e^2-1/9*b*(-c^2*x^2+1)^(3/2)/c^3/e-b*d*x*arcsin(c*x)/e^2+1/3*x^3*(a+b*arcsin(c*x))/e+1/2*(-d)^(3/2)*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)-1/2*(-d)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)+1/2*(-d)^(3/2)*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)-1/2*(-d)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)+1/2*I*b*(-d)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)-1/2*I*b*(-d)^(3/2)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)+1/2*I*b*(-d)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)-1/2*I*b*(-d)^(3/2)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)-b*d*(-c^2*x^2+1)^(1/2)/c/e^2+1/3*b*(-c^2*x^2+1)^(1/2)/c^3/e

Rubi [A]
time = 0.77, antiderivative size = 653, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {4817, 4715, 267, 4723, 272, 45, 4757, 4825, 4617, 2221, 2317, 2438}

$$\frac{(-d)^{3/2}(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}-\frac{(-d)^{3/2}(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}+\frac{(-d)^{3/2}(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}-\frac{(-d)^{3/2}(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}}+\frac{x^3(a+b\text{ArcSin}(cx))}{3e}-\frac{adx}{e^2}+\frac{ib(-d)^{3/2}\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{5/2}}-\frac{ib(-d)^{3/2}\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{5/2}}+\frac{ib(-d)^{3/2}\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e^{5/2}}-\frac{ib(-d)^{3/2}\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e^{5/2}}-\frac{bdx\text{ArcSin}(cx)}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}-\frac{b(1-c^2x^2)^{3/2}}{9c^3e}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}$$

Antiderivative was successfully verified.

[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2),x]

[Out] -((a*d*x)/e^2) - (b*d*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*Sqrt[1 - c^2*x^2])/(3*c^3*e) - (b*(1 - c^2*x^2)^(3/2))/(9*c^3*e) - (b*d*x*ArcSin[c*x])/e^2 + (x^3*(a + b*ArcSin[c*x]))/(3*e) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) - ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5/2)) - ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((I/2)*b*(-d)^(3/2)*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^(5/2) - ((I/2)*b*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(5/2) + ((I/2)*b*(-d)^(3/2)*PolyLog[2, -((Sqrt[e

```
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2) - ((I/2)*b
*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2
*d + e])])/e^(5/2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
```

```
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))}{d+ex^2}\,dx = \int \left(-\frac{d(a+b\sin^{-1}(cx))}{e^2} + \frac{x^2(a+b\sin^{-1}(cx))}{e} + \frac{d^2(a+b\sin^{-1}(cx))}{e^2\,(d+ex^2)}\right)\,dx$$

$$= -\frac{d\int(a+b\sin^{-1}(cx))\,dx}{e^2} + \frac{d^2\int\frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{e^2} + \frac{\int x^2(a+b\sin^{-1}(cx))\,dx}{e}$$

$$= -\frac{adx}{e^2} + \frac{x^3(a+b\sin^{-1}(cx))}{3e} - \frac{(bd)\int\sin^{-1}(cx)\,dx}{e^2} + \frac{d^2\int\left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \right.}{e^2}$$

$$= -\frac{adx}{e^2} - \frac{bdx\sin^{-1}(cx)}{e^2} + \frac{x^3(a+b\sin^{-1}(cx))}{3e} - \frac{(-d)^{3/2}\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2e^2} - \frac{(-}{}$$

$$= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} - \frac{bdx\sin^{-1}(cx)}{e^2} + \frac{x^3(a+b\sin^{-1}(cx))}{3e} - \frac{(-d)^{3/2}\text{Subst}\Big(}{}$$

$$= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} + \frac{b\sqrt{1-c^2x^2}}{3c^3e} - \frac{b(1-c^2x^2)^{3/2}}{9c^3e} - \frac{bdx\sin^{-1}(cx)}{e^2} + \frac{x^3(a}{}$$

$$= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} + \frac{b\sqrt{1-c^2x^2}}{3c^3e} - \frac{b(1-c^2x^2)^{3/2}}{9c^3e} - \frac{bdx\sin^{-1}(cx)}{e^2} + \frac{x^3(a}{}$$

$$= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} + \frac{b\sqrt{1-c^2x^2}}{3c^3e} - \frac{b(1-c^2x^2)^{3/2}}{9c^3e} - \frac{bdx\sin^{-1}(cx)}{e^2} + \frac{x^3(a}{}$$

$$= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} + \frac{b\sqrt{1-c^2x^2}}{3c^3e} - \frac{b(1-c^2x^2)^{3/2}}{9c^3e} - \frac{bdx\sin^{-1}(cx)}{e^2} + \frac{x^3(a}{}$$

Mathematica [A]
time = 0.57, size = 515, normalized size = 0.79

$$-\frac{adx}{e^2} + \frac{ax^3}{3e} + \frac{ad^{3/2}\text{ArcTan}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{5/2}} + \frac{b\left(-\frac{4d\sqrt{e}\left(\sqrt{1-c^2x^2}+cx\text{ArcSin}(cx)\right)}{c} + \frac{4e^{3/2}\left(\sqrt{1-c^2x^2}\,(2+c^2x^2)+3c^3x^3\text{ArcSin}(cx)\right)}{9c^3} + d^{3/2}\left(-\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)-2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)-2\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)+d^{3/2}\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)}{4e^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] -((a*d*x)/e^2) + (a*x^3)/(3*e) + (a*d^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/e^
(5/2) + (b*((-4*d*Sqrt[e]*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]))/c + (4*e^(
3/2)*(Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + 3*c^3*x^3*ArcSin[c*x]))/(9*c^3) + d
^(3/2)*(-(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*
```

```
x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(
c*Sqrt[d] + Sqrt[c^2*d + e])]))) - 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))
/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] - 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*
x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) + d^(3/2)*(ArcSin[c*x]*(ArcSin[c*x] +
 (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e]
)] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) +
 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] +
2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/
(4*e^(5/2))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 12.53, size = 394, normalized size = 0.60

method	result
derivativedivides	$\frac{-\frac{a c^5 d x}{e^2}+\frac{a c^5 x^3}{3e}+\frac{a c^5 d^2 \arctan\left(\frac{e x}{\sqrt{d e}}\right)}{e^2\sqrt{d e}}-\frac{b c^4\sqrt{-c^2x^2+1}\, d}{e^2}-\frac{b c^5 \arcsin(cx) d x}{e^2}+\frac{b c^2\sqrt{-c^2x^2+1}}{4e}+\frac{b c^3 \arcsi}{4e}}{}$
default	$\frac{-\frac{a c^5 d x}{e^2}+\frac{a c^5 x^3}{3e}+\frac{a c^5 d^2 \arctan\left(\frac{e x}{\sqrt{d e}}\right)}{e^2\sqrt{d e}}-\frac{b c^4\sqrt{-c^2x^2+1}\, d}{e^2}-\frac{b c^5 \arcsin(cx) d x}{e^2}+\frac{b c^2\sqrt{-c^2x^2+1}}{4e}+\frac{b c^3 \arcsi}{4e}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-a*c^5/e^2*d*x+1/3*a*c^5/e*x^3+a*c^5*d^2/e^2/(d*e)^(1/2)*arctan(e*x/
(d*e)^(1/2))-b*c^4/e^2*(-c^2*x^2+1)^(1/2)*d-b*c^5/e^2*arcsin(c*x)*d*x+1/4*b
*c^2/e*(-c^2*x^2+1)^(1/2)+1/4*b*c^3/e*arcsin(c*x)*x-1/2*b*c^6*d^2/e^2*sum(1
/_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/
_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d
-2*e)*_Z^2+e))-1/2*b*c^6*d^2/e^2*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x
)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2
))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/36*b*c^2/e*cos(3*arcsi
n(c*x))-1/12*b*c^2*arcsin(c*x)/e*sin(3*arcsin(c*x)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/3*(3*d^(3/2)*arctan(x*e^(1/2)/sqrt(d))*e^(-5/2) + (x^3*e - 3*d*x)*e^(-2))
*a + b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^2*e + d)
, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(x^2*e + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a + b \operatorname{asin}(cx))}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:Evaluation time: 0.62sym2poly/r2sym(const gen & e,const i
ndex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a + b\,\mathrm{asin}(c\,x)\right)}{e\,x^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d + e*x^2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d + e*x^2), x)
```

3.625 $\int \frac{x^3(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=559

$$\frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\text{ArcSin}(cx)}{4c^2e}+\frac{x^2(a+b\text{ArcSin}(cx))}{2e}+\frac{id(a+b\text{ArcSin}(cx))^2}{2be^2}-\frac{d(a+b\text{ArcSin}(cx))\log\left(1-\frac{\cdots}{i\cdots}\right.}{2e^2}$$

```
[Out] -1/4*b*arcsin(c*x)/c^2/e+1/2*x^2*(a+b*arcsin(c*x))/e+1/2*I*d*(a+b*arcsin(c*
x))^2/b/e^2-1/2*d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)
/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*d*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*d*(a+
b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2
*d+e)^(1/2)))/e^2-1/2*d*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e
^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2+1/2*I*b*d*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2+1/2*I*b*d*p
olylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)
))/e^2+1/2*I*b*d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)+(c^2*d+e)^(1/2)))/e^2+1/2*I*b*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^
(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2+1/4*b*x*(-c^2*x^2+1)^(1/2)/c/e
```

Rubi [A]
time = 0.63, antiderivative size = 559, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {4817, 4723, 327, 222, 4825, 4617, 2221, 2317, 2438}

$$-\frac{d(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{d(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{d(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}-\frac{d(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{id(a+b\text{ArcSin}(cx))^2}{2be^2}+\frac{x^2(a+b\text{ArcSin}(cx))}{2e}+\frac{ibd\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2}+\frac{ibd\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2}+\frac{ibd\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^2}+\frac{ibd\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^2}-\frac{b\text{ArcSin}(cx)}{4c^2e}+\frac{bx\sqrt{1-c^2x^2}}{4ce}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(4*c*e) - (b*ArcSin[c*x])/(4*c^2*e) + (x^2*(a + b*A
rcSin[c*x]))/(2*e) + ((I/2)*d*(a + b*ArcSin[c*x])^2)/(b*e^2) - (d*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1
- (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) -
(d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] +
Sqrt[c^2*d + e])])/(2*e^2) + ((I/2)*b*d*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^2 + ((I/2)*b*d*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))]
)/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/e^2
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
```

```
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{d+ex^2}\,dx = \int \left(\frac{x(a+b\sin^{-1}(cx))}{e} - \frac{dx(a+b\sin^{-1}(cx))}{e\,(d+ex^2)}\right)dx$$

$$= \frac{\int x(a+b\sin^{-1}(cx))\,dx}{e} - \frac{d\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{e}$$

$$= \frac{x^2(a+b\sin^{-1}(cx))}{2e} - \frac{(bc)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2e} - \frac{d\int\left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\quad}{2\sqrt{\quad}}\right.}{e}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} + \frac{x^2(a+b\sin^{-1}(cx))}{2e} + \frac{d\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2e^{3/2}} - \frac{d\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}\,x}\,d}{2e^{3/2}}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\sin^{-1}(cx)}{4c^2e} + \frac{x^2(a+b\sin^{-1}(cx))}{2e} + \frac{d\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\,\sin(}\right.}{2e^{3/2}}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\sin^{-1}(cx)}{4c^2e} + \frac{x^2(a+b\sin^{-1}(cx))}{2e} + \frac{id(a+b\sin^{-1}(cx))^2}{2be^2} + \frac{(id}{\quad}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\sin^{-1}(cx)}{4c^2e} + \frac{x^2(a+b\sin^{-1}(cx))}{2e} + \frac{id(a+b\sin^{-1}(cx))^2}{2be^2} - \frac{d(a}{\quad}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\sin^{-1}(cx)}{4c^2e} + \frac{x^2(a+b\sin^{-1}(cx))}{2e} + \frac{id(a+b\sin^{-1}(cx))^2}{2be^2} - \frac{d(a}{\quad}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\sin^{-1}(cx)}{4c^2e} + \frac{x^2(a+b\sin^{-1}(cx))}{2e} + \frac{id(a+b\sin^{-1}(cx))^2}{2be^2} - \frac{d(a}{\quad}$$

Mathematica [A]
time = 0.26, size = 475, normalized size = 0.85

$$\frac{2ac^2ex^2 - 2ac^2d\log(d+ex^2) + b\left(e\left(cx\sqrt{1-c^2x^2} + 2c^2x^2\text{ArcSin}(cx) - 2\text{ArcTan}\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right) + ic^2d\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx) + 2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right) + \log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right) + 2\text{PolyLog}\left(2, \frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right) + 2\text{PolyLog}\left(2, -\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right) + ic^2d\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx) + 2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right) + \log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right) + 2\text{PolyLog}\left(2, \frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right) + 2\text{PolyLog}\left(2, \frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)}{4c^2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (2*a*c^2*e*x^2 - 2*a*c^2*d*Log[d + e*x^2] + b*(e*(c*x*Sqrt[1 - c^2*x^2] + 2
*c^2*x^2*ArcSin[c*x] - 2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]) + I*c^2*d*
(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*S
qrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
```

```
 + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt
[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sq
rt[d] + Sqrt[c^2*d + e]))]) + I*c^2*d*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Lo
g[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1
 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog
[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[
2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(4*c^2*e^2
)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.96, size = 2912, normalized size = 5.21

method	result	size
derivativedivides	Expression too large to display	2912
default	Expression too large to display	2912

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-2*b*c^8/e^4*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(
c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^3+3/4*I*b*c^4*polylog(2,e*(I*c*x+(-c^2*x^
2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)*(d*c^2*(
c^2*d+e))^(1/2)*d+3/2*I*b*c^6*d^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/
(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2
)+I*b*c^8*d^3*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c
^2*d+e))^(1/2)+e))/e^4/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)+I*b*c^4*(d*c^2*(c^
2*d+e))^(1/2)/e^2*d/(c^2*d+e)*arcsin(c*x)^2-2*b*c^8/e^4*d^3/(c^2*d+e)*ln(1-
e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsi
n(c*x)*(d*c^2*(c^2*d+e))^(1/2)-3*b*c^6/e^3*d^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(d*c^2
*(c^2*d+e))^(1/2)-3/2*b*c^4/e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(d*c^2*(c^2*d+e))^(1/
2)*d+1/2*b*c^4*(d*c^2*(c^2*d+e))^(1/2)/e^2*d/(c^2*d+e)*arcsin(c*x)*ln(1-e*(
I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))-1/4*I*b*
c^4*(d*c^2*(c^2*d+e))^(1/2)/e^2*d/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)
^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))+2*I*b*c^8*d^3*arcsin(c*x)^
2/e^4/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)+3*I*b*c^6*d^2*arcsin(c*x)^2/e^3/(c^
2*d+e)*(d*c^2*(c^2*d+e))^(1/2)+I*b*c^6*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2
))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*d^2/e^3+1/2*I*b*c^4*d/e^2*sum((
-_R1^2*e+4*c^2*d+2*e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c
^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf
(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/4*I*b*c^4*polylog(2,e*(I*c*x+(-c^2*x^2+1)
^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*d/e^2+2*I*b*c^6*arcsin(c*x
)^2*d^2/e^3+2*I*b*c^8*arcsin(c*x)^2*d^3/e^4+I*b*c^4*arcsin(c*x)^2*d/e^2+I*b
*c^8*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^
```

```
(1/2)+e))*d^3/e^4-2*b*c^6/e^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+
2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^2-1/2*b*c^4/e^2*ln(1-e*(I*c*x+(
-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d+1
/4*b*c^3/e*(-c^2*x^2+1)^(1/2)*x+1/2*b*c^4*arcsin(c*x)/e*x^2-1/4*b*c^2/e*arc
sin(c*x)-1/2*a*c^4*d/e^2*ln(c^2*e*x^2+c^2*d)+1/2*a*c^4/e*x^2+1/4*b*c^2*(d*c
^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2
))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))+b*c^4/e^3*ln(1-e*(I*c*x+(-c^2*x
^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d*(d*c^2*
(c^2*d+e))^(1/2)+2*b*c^6/e^4*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2
*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^2*(d*c^2*(c^2*d+e))^(1/2)+2*b*c^
10/e^4*d^4/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*
(c^2*d+e))^(1/2)+e))*arcsin(c*x)+4*b*c^8/e^3*d^3/(c^2*d+e)*ln(1-e*(I*c*x+(-
c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+5/2*
b*c^6/e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(
c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^2+1/2*b*c^4/e/(c^2*d+e)*ln(1-e*(I*c*x+(-c
^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d-1/4
*b*c^2/e/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c
^2*d+e))^(1/2)+e))*arcsin(c*x)*(d*c^2*(c^2*d+e))^(1/2)-1/2*I*b*c^4*polylog(
2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*d/e
^3*(d*c^2*(c^2*d+e))^(1/2)-I*b*c^4*arcsin(c*x)^2*d/e^3*(d*c^2*(c^2*d+e))^(1
/2)-I*b*c^6*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2
*d+e))^(1/2)+e))*d^2/e^4*(d*c^2*(c^2*d+e))^(1/2)-5/2*I*b*c^6*arcsin(c*x)^2/
e^2/(c^2*d+e)*d^2-1/2*I*b*c^4*arcsin(c*x)^2/e/(c^2*d+e)*d-2*I*b*c^10*d^4*ar
csin(c*x)^2/e^4/(c^2*d+e)-4*I*b*c^8*d^3*arcsin(c*x)^2/e^3/(c^2*d+e)-5/4*I*b
*c^6*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^
(1/2)+e))/e^2/(c^2*d+e)*d^2-1/4*I*b*c^4*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/
2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e/(c^2*d+e)*d-2*I*b*c^6*arcsin
(c*x)^2*d^2/e^4*(d*c^2*(c^2*d+e))^(1/2)-I*b*c^10*d^4*polylog(2,e*(I*c*x+(-c
^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^4/(c^2*d+e)-2*I
*b*c^8*d^3*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*
d+e))^(1/2)+e))/e^3/(c^2*d+e)+1/8*I*b*c^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(
1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e/(c^2*d+e)*(d*c^2*(c^2*d+e)
)^(1/2)-1/8*I*b*c^2*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)*polylog(2,e*(I*c*x+
(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*(x^2*e^(-1) - d*e^(-2)*log(x^2*e + d))*a + b*integrate(x^3*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^2*e + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(x^2*e + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(a + b\operatorname{asin}(cx))}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{e\,x^2+d} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d + e*x^2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d + e*x^2), x)
```

3.626 $\int \frac{x^2(a+b\textbf{ArcSin}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=579

$$\frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\text{ArcSin}(cx)}{e}+\frac{\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}}-\frac{\sqrt{-d}\,(a+b\text{ArcSin}(cx)}{}$$

```
[Out] a*x/e+b*x*arcsin(c*x)/e+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*(a+b*ar
csin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e
)^(1/2)))*(-d)^(1/2)/e^(3/2)+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)
^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*(a
+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^
2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*I*b*p
olylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)
))*(-d)^(1/2)/e^(3/2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)
/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*I*b*polylog(2,(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2
)/e^(3/2)+b*(-c^2*x^2+1)^(1/2)/c/e
```

Rubi [A]
time = 0.63, antiderivative size = 579, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {4817, 4715, 267, 4757, 4825, 4617, 2221, 2317, 2438}

$$\frac{\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}-\frac{\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}+\frac{\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}-\frac{\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}}+\frac{ax}{e}+\frac{ib\sqrt{-d}\,\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{3/2}}-\frac{ib\sqrt{-d}\,\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{3/2}}+\frac{ib\sqrt{-d}\,\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e^{3/2}}-\frac{ib\sqrt{-d}\,\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e^{3/2}}+\frac{bx\text{ArcSin}(cx)}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (a*x)/e + (b*Sqrt[1 - c^2*x^2])/(c*e) + (b*x*ArcSin[c*x])/e + (Sqrt[-d]*(a
+ b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(3/2)) + (Sqrt[-d
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(3/2)) + ((I
/2)*b*Sqrt[-d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e]))])/e^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(3/2) + ((I/2)*b*Sqrt[-d]*Pol
yLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e
^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e])])/e^(3/2)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{d+ex^2}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{e}-\frac{d(a+b\sin^{-1}(cx))}{e\,(d+ex^2)}\right)dx$$

$$= \frac{\int (a+b\sin^{-1}(cx))\,dx}{e}-\frac{d\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{e}$$

$$= \frac{ax}{e}+\frac{b\int \sin^{-1}(cx)\,dx}{e}-\frac{d\int \left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx}{e}$$

$$= \frac{ax}{e}+\frac{bx\sin^{-1}(cx)}{e}-\frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{e}-\frac{\sqrt{-d}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2e}-\frac{\sqrt{-d}}{}$$

$$= \frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\sin^{-1}(cx)}{e}-\frac{\sqrt{-d}\,\mathrm{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\,\sin(x)}\,dx,x,\sin^{-}\right.}{2e}$$

$$= \frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\sin^{-1}(cx)}{e}-\frac{\left(i\sqrt{-d}\right)\mathrm{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}}\right.}{2e}$$

$$= \frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\sin^{-1}(cx)}{e}+\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin}}{ic\sqrt{-d}-\sqrt{}}\right.}{2e^{3/2}}$$

$$= \frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\sin^{-1}(cx)}{e}+\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin}}{ic\sqrt{-d}-\sqrt{}}\right.}{2e^{3/2}}$$

$$= \frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\sin^{-1}(cx)}{e}+\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin}}{ic\sqrt{-d}-\sqrt{}}\right.}{2e^{3/2}}$$

Mathematica [A]
time = 0.23, size = 456, normalized size = 0.79

$$\frac{4ac\sqrt{e}\,x-4ac\sqrt{d}\,\text{ArcTan}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)+b\left(4\sqrt{e}\left(\sqrt{1-c^2x^2}+cx\text{ArcSin}(cx)\right)+c\sqrt{d}\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)-c\sqrt{d}\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)}{4ce^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (4*a*c*Sqrt[e]*x - 4*a*c*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] + b*(4*Sqrt[e]
*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) + c*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x
] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e]
)] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) +
 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])]
 + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])
)]) - c*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(4*c*e^(3/2))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 2.02, size = 300, normalized size = 0.52

method	result
derivativedivides	$\frac{\frac{a\,c^3 x}{e}-\frac{a\,c^3 d \arctan\left(\frac{ex}{\sqrt{de}}\right)}{e\sqrt{de}}+\frac{b\,c^2\sqrt{-c^2x^2+1}}{e}+\frac{b\,c^3\arcsin(cx)x}{e}+\frac{b\,c^4 d\left(\sum_{\_R1=\text{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\right.}{}}{}$
default	$\frac{\frac{a\,c^3 x}{e}-\frac{a\,c^3 d \arctan\left(\frac{ex}{\sqrt{de}}\right)}{e\sqrt{de}}+\frac{b\,c^2\sqrt{-c^2x^2+1}}{e}+\frac{b\,c^3\arcsin(cx)x}{e}+\frac{b\,c^4 d\left(\sum_{\_R1=\text{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(a*c^3/e*x-a*c^3*d/e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+b*c^2/e*(-c^
2*x^2+1)^(1/2)+b*c^3/e*arcsin(c*x)*x+1/2*b*c^4*d/e*sum(1/_R1/(-_R1^2*e+2*c^
2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c
*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*
b*c^4*d/e*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x
```

```
^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_
Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
[Out] -(sqrt(d)*arctan(x*e^(1/2)/sqrt(d))*e^(-3/2) - x*e^(-1))*a + b*integrate(x^
2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^2*e + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(x^2*e + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a+b\operatorname{asin}(cx))}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d),x)
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:Evaluation time: 0.47sym2poly/r2sym(const gen & e,const i
ndex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d + e*x^2),x)
[Out] int((x^2*(a + b*asin(c*x)))/(d + e*x^2), x)
```

3.627 $\int \frac{x(a+b\mathbf{ArcSin}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=491

$$-\frac{i(a+b\text{ArcSin}(cx))^2}{2be}+\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}}{ic\sqrt{-}}\right.}{2e}$$

```
[Out] -1/2*I*(a+b*arcsin(c*x))^2/b/e+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e+1/2*(a+b*arcsin(c*x))
*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/
e+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)+(c^2*d+e)^(1/2)))/e+1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/
2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e-1/2*I*b*polylog(2,-(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e-1/2*I*b*poly
log(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/
e-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^
2*d+e)^(1/2)))/e-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*
(-d)^(1/2)+(c^2*d+e)^(1/2)))/e
```

Rubi [A]
time = 0.52, antiderivative size = 491, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {4817, 4825, 4617, 2221, 2317, 2438}

$$\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}+\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e}-\frac{i(a+b\text{ArcSin}(cx))^2}{2be}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] ((-1/2*I)*(a + b*ArcSin[c*x])^2)/(b*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e) + ((a + b*A
rcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
+ e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) - ((I/2)*b*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[
c^2*d + e])])/e - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e]))])/e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx = \int \left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx$$

$$= -\frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2\sqrt{e}}+\frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2\sqrt{e}}$$

$$= -\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{e}}+\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x\right.}{2\sqrt{e}}$$

$$= -\frac{i(a+b\sin^{-1}(cx))^2}{2be}-\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}\,e^{ix}}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{e}}-$$

$$= -\frac{i(a+b\sin^{-1}(cx))^2}{2be}+\frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}+\frac{(a+b}{}$$

$$= -\frac{i(a+b\sin^{-1}(cx))^2}{2be}+\frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}+\frac{(a+b}{}$$

$$= -\frac{i(a+b\sin^{-1}(cx))^2}{2be}+\frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}+\frac{(a+b}{}$$

Mathematica [A]

time = 0.10, size = 399, normalized size = 0.81

$$-\frac{i\left(b\text{ArcSin}(cx)^2+ib\text{ArcSin}(cx)\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+ib\text{ArcSin}(cx)\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+ib\text{ArcSin}(cx)\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)+ib\text{ArcSin}(cx)\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)+ia\log(d+ex^2)+b\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+b\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+b\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)+b\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)}{2e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] ((-1/2*I)*(b*ArcSin[c*x]^2 + I*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c
*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + I*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(
I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + I*b*ArcSin[c*x]*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + I*b*ArcSin[c*
x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + I*a
*Log[d + e*x^2] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqr
t[c^2*d + e])] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + S
qrt[c^2*d + e])] + b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] +
```

```
Sqrt[c^2*d + e]))] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] +
Sqrt[c^2*d + e])]))/e
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.27, size = 2789, normalized size = 5.68

method	result	size
derivativedivides	Expression too large to display	2789
default	Expression too large to display	2789

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-I*b*c^2*arcsin(c*x)^2/e+1/2*I*b*c^2*arcsin(c*x)^2/(c^2*d+e)+1/4*I*b
*c^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^
(1/2)+e))/(c^2*d+e)-1/2*I*b*c^2/e*sum((-_R1^2*e+4*c^2*d+2*e)/(-_R1^2*e+2*c^
2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c
*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*
b*c^2/e*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1
/2)+e))*arcsin(c*x)-1/2*b*c^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2
/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)-1/4*I*b*c^2*polylog(2,e
*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e-1/4*
b*(d*c^2*(c^2*d+e))^(1/2)/d/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1
)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))+1/2*a*c^2/e*ln(c^2*e*x^2+
c^2*d)-I*b*c^4*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(
c^2*d+e))^(1/2)+e))/e^2*d+I*b*c^4*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/
(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*d/e^3*(d*c^2*(c^2*d+e))^(1/2)+I*b*c^
8*d^3*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))
^(1/2)+e))/e^3/(c^2*d+e)+2*I*b*c^4*arcsin(c*x)^2*d/e^3*(d*c^2*(c^2*d+e))^(1
/2)+2*I*b*c^8*d^3*arcsin(c*x)^2/e^3/(c^2*d+e)+5/4*I*b*c^4*polylog(2,e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e*d/(c^2*d+e
)+4*I*b*c^6*arcsin(c*x)^2/e^2/(c^2*d+e)*d^2+5/2*I*b*c^4*arcsin(c*x)^2/e/(c^
2*d+e)*d+2*I*b*c^6*d^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*
(d*c^2*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)+1/4*b/d/(c^2*d+e)*ln(1-e*(I*c*x+(
-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(d*
c^2*(c^2*d+e))^(1/2)-2*I*b*c^6*arcsin(c*x)^2*d^2/e^3-I*b*c^6*polylog(2,e*(I
*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*d^2/e^3-2
*I*b*c^4*arcsin(c*x)^2*d/e^2-3/2*I*b*c^4*d*polylog(2,e*(I*c*x+(-c^2*x^2+1)^
(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)*(d*c^2*(c^2*d
+e))^(1/2)-3*I*b*c^4*(d*c^2*(c^2*d+e))^(1/2)/e^2*d/(c^2*d+e)*arcsin(c*x)^2-
2*I*b*c^6*d^2*arcsin(c*x)^2/e^3/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-I*b*c^6*d
^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1
/2)+e))/e^3/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-3/4*I*b*c^2*polylog(2,e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e/(c^2*d+e)*
(d*c^2*(c^2*d+e))^(1/2)-I*b*c^2*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(
```

```
c*x)^2+1/4*I*b*c^2*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)*polylog(2,e*(I*c*x+(
-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))+2*b*c^6/e^3*d^2
/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))
^(1/2)+e))*arcsin(c*x)*(d*c^2*(c^2*d+e))^(1/2)+3*b*c^4/e^2/(c^2*d+e)*ln(1-e
*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin
(c*x)*(d*c^2*(c^2*d+e))^(1/2)*d+2*b*c^6/e^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2
))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^2+2*b*c^4/e^2*ln(
1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arc
sin(c*x)*d+I*b*c^2*arcsin(c*x)^2/e^2*(d*c^2*(c^2*d+e))^(1/2)+1/2*I*b*c^2*po
lylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e
))/e^2*(d*c^2*(c^2*d+e))^(1/2)-b*c^2/e^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^
2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(d*c^2*(c^2*d+e))^(1/2
)+1/8*I*b*(d*c^2*(c^2*d+e))^(1/2)/d/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+
1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))-1/8*I*b*polylog(2,e*(I*c
*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/d/(c^2*d+e)
*(d*c^2*(c^2*d+e))^(1/2)-1/2*b*c^2*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcs
in(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1
/2)+e))-2*b*c^4/e^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(
c^2*d+e))^(1/2)+e))*arcsin(c*x)*d*(d*c^2*(c^2*d+e))^(1/2)-2*b*c^8/e^3*d^3/(
c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(
1/2)+e))*arcsin(c*x)-4*b*c^6/e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2)
)^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*d^2-5/2*b*c^4/e/(c^2
*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2
)+e))*arcsin(c*x)*d+3/2*b*c^2/e/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)*(d*c^2*(c^2*d+e))^(1/
2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*e^(-1)*log(x^2*e + d) + b*integrate(x*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))/(x^2*e + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x*arcsin(c*x) + a*x)/(x^2*e + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a + b\,\mathrm{asin}\,(cx))}{d + ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d),x)
[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d + e*x^2),x)
[Out] int((x*(a + b*asin(c*x)))/(d + e*x^2), x)
```

3.628 $\int \frac{a+b\mathbf{ArcSin}(cx)}{d+ex^2} \, dx$

Optimal. Leaf size=541

$$\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}+\frac{(a+b$$

```
[Out] 1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(
1/2)+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d
)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2
)/e^(1/2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^
2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)+1/
2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+
e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)
```

Rubi [A]
time = 0.53, antiderivative size = 541, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4757, 4825, 4617, 2221, 2317, 2438}

$$\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\,\sqrt{e}}+\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\,\sqrt{e}}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2),x]
```

```
[Out] ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sq
rt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e
]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*S
qrt[e]) + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + ((I/
2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx = \int \left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx$$

$$= -\frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2\sqrt{-d}} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2\sqrt{-d}}$$

$$= -\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\,\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\,\sin(x)}\,dx, x, \text{si}\right.}{2\sqrt{-d}}$$

$$= -\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}\,e^{ix}}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{i\text{Subst}\left(\int \frac{e^{ix}(a\cdots}{ic\sqrt{-d}+\sqrt{c^2 a\cdots}}\right.}{2\cdots}$$

$$= \frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}} - \frac{(a+b\sin^{-1}(cx))\log\left(1+\frac{\sqrt{e}\cdots}{ic\sqrt{-d}\cdots}\right.}{2\sqrt{-d}\,\sqrt{e}}$$

$$= \frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}} - \frac{(a+b\sin^{-1}(cx))\log\left(1+\frac{\sqrt{e}\cdots}{ic\sqrt{-d}\cdots}\right.}{2\sqrt{-d}\,\sqrt{e}}$$

$$= \frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}} - \frac{(a+b\sin^{-1}(cx))\log\left(1+\frac{\sqrt{e}\cdots}{ic\sqrt{-d}\cdots}\right.}{2\sqrt{-d}\,\sqrt{e}}$$

Mathematica [A]
time = 0.30, size = 490, normalized size = 0.91

$$\frac{2a\sqrt{-d}\,\text{ArcTan}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)-b\sqrt{d}\,\text{ArcSin}(cx)\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)+b\sqrt{d}\,\text{ArcSin}(cx)\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-ic\sqrt{-d}+\sqrt{c^2d+e}}\right)+b\sqrt{d}\,\text{ArcSin}(cx)\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)-b\sqrt{d}\,\text{ArcSin}(cx)\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)-ib\sqrt{d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)+ib\sqrt{d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-ic\sqrt{-d}+\sqrt{c^2d+e}}\right)+ib\sqrt{d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)-ib\sqrt{d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d^2}\,\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2),x]
```

```
[Out] (2*a*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - b*Sqrt[d]*ArcSin[c*x]*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + b*Sqrt[d]*Ar
cSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d
 + e])] + b*Sqrt[d]*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])] - b*Sqrt[d]*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - I*b*Sqrt[d]*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + I*b*Sqrt[d]*Pol
yLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] +
```

```
I*b*Sqrt[d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c
^2*d + e]))] - I*b*Sqrt[d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d^2]*Sqrt[e])
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.14, size = 243, normalized size = 0.45

method	result
derivativedivides	$\frac{\frac{ac\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}-\frac{bc^2\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{i\arcsin(cx)\ln\left(\frac{\_R1-icx-\sqrt{-c^2x^2+1}}{\_R1}\right)+\mathrm{dil}}{\_R1\left(-\_R1^2e+2\right.}\right.}{2}}{}$
default	$\frac{\frac{ac\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}-\frac{bc^2\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{i\arcsin(cx)\ln\left(\frac{\_R1-icx-\sqrt{-c^2x^2+1}}{\_R1}\right)+\mathrm{dil}}{\_R1\left(-\_R1^2e+2\right.}\right.}{2}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a*c/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/2*b*c^2*sum(1/_R1/(-_R1^2*e+
2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1
-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-
1/2*b*c^2*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x
^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_
Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] a*arctan(x*e^(1/2)/sqrt(d))*e^(-1/2)/sqrt(d) + b*integrate(arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))/(x^2*e + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^2*e + d), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{e\,x^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d + e*x^2),x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2), x)
```

3.629 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x(d+ex^2)}\,dx$

Optimal. Leaf size=518

$$-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}-\frac{(a$$

```
[Out] (a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*(a+b*arcsin(c*x)
)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))
/d-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^
(1/2)-(c^2*d+e)^(1/2)))/d-1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d-1/2*(a+b*arcsin(c*x))*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d-1/2
*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+1/2*I*b*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d+1/2*I*b*polyl
og(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d
+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2
*d+e)^(1/2)))/d+1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(
-d)^(1/2)+(c^2*d+e)^(1/2)))/d
```

Rubi [A]

time = 0.65, antiderivative size = 518, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$, Rules used = {4817, 4721, 3798, 2221, 2317, 2438, 4825, 4617}

$$-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}+\frac{\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] -1/2*((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 - Sqrt[c^2*d + e])])/d - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d) - ((a + b*ArcSin[c*x])*Log
[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d) -
 ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*d) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x]
)])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d - ((I/2)*b*Poly
Log[2, E^((2*I)*ArcSin[c*x])])/d
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\,(d+ex^2)}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{dx} - \frac{ex(a+b\sin^{-1}(cx))}{d\,(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d} - \frac{e\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{d}$$

$$= \frac{\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \sin^{-1}(cx)\right)}{d} - \frac{e\int \left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\,\mathrm{s}}{2\sqrt{e}\left(\sqrt{\right.}}\right.}{d}$$

$$= -\frac{i(a+b\sin^{-1}(cx))^2}{2bd} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \sin^{-1}(cx)\right)}{d} + \frac{\sqrt{e}\int \frac{a+b\sin^{-1}(c}{\sqrt{-d}-\sqrt{}}}{2d}$$

$$= -\frac{i(a+b\sin^{-1}(cx))^2}{2bd} + \frac{(a+b\sin^{-1}(cx))\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d} - \frac{b\text{Subst}\left(\int \log(1-\right.}{}$$

$$= \frac{(a+b\sin^{-1}(cx))\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\sin^{-1}(cx)}\right)}{2d} + \cdots$$

$$= -\frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\sin^{-1}(cx))\log\left(1+\frac{}{ic\sqrt{}}\right.}{2d}$$

$$= -\frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\sin^{-1}(cx))\log\left(1+\frac{}{ic\sqrt{}}\right.}{2d}$$

$$= -\frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\sin^{-1}(cx))\log\left(1+\frac{}{ic\sqrt{}}\right.}{2d}$$

Mathematica [A]
time = 0.48, size = 441, normalized size = 0.85

$$\frac{a\log(x)}{d} - \frac{a\log(d+ex^2)}{2d} + \frac{b\left(-4i\text{ArcSin}\left(\sqrt{-\frac{c^2d}{e}}\right)\text{ArcTan}\left(\frac{c(c^2d+e)x}{\sqrt{c^2d(c^2d+e)}\sqrt{1-c^2x^2}}\right) + 4\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right) - 2\text{ArcSin}\left(\sqrt{-\frac{c^2d}{e}}\right)\log\left(1-\frac{\left(2c^2d+e-2\sqrt{c^2d(c^2d+e)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) - 2\text{ArcSin}(cx)\log\left(1-\frac{\left(2c^2d+e-2\sqrt{c^2d(c^2d+e)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) + 2\text{ArcSin}\left(\sqrt{-\frac{c^2d}{e}}\right)\log\left(1-\frac{\left(2c^2d+e+2\sqrt{c^2d(c^2d+e)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) - 2\text{ArcSin}(cx)\log\left(1-\frac{\left(2c^2d+e+2\sqrt{c^2d(c^2d+e)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) - 2i\text{PolyLog}\left(2, e^{2i\text{ArcSin}(cx)}\right) + i\text{PolyLog}\left(2, \frac{\left(2c^2d+e-2\sqrt{c^2d(c^2d+e)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) + i\text{PolyLog}\left(2, \frac{\left(2c^2d+e+2\sqrt{c^2d(c^2d+e)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right)\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] (a*Log[x])/d - (a*Log[d + e*x^2])/(2*d) + (b*((-4*I)*ArcSin[Sqrt[-((c^2*d)/
e)]]*ArcTan[(c*(c^2*d + e)*x)/(Sqrt[c^2*d*(c^2*d + e)]*Sqrt[1 - c^2*x^2])]
+ 4*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - 2*ArcSin[Sqrt[-((c^2*d)/e)
]]*Log[1 - ((2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x])
)/e] - 2*ArcSin[c*x]*Log[1 - ((2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^(
(2*I)*ArcSin[c*x]))/e] + 2*ArcSin[Sqrt[-((c^2*d)/e)]]*Log[1 - ((2*c^2*d + e
 + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] - 2*ArcSin[c*x]*Log
[1 - ((2*c^2*d + e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] -
 (2*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])] + I*PolyLog[2, ((2*c^2*d + e - 2*S
qrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + I*PolyLog[2, ((2*c^2*d
+ e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e]))/(4*d)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.37, size = 352, normalized size = 0.68

method	result
derivativedivides	$-\frac{a\ln\left(c^{2}e\,x^{2}+c^{2}d\right)}{2d}+\frac{a\ln\left(cx\right)}{d}+\frac{ib\,\mathrm{dilog}\left(icx+\sqrt{-c^{2}x^{2}+1}\right)}{d}+\frac{ib\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^{4}+\left(-4c^{2}d-2e\right)\_Z^{2}+e\right)}\right.}{}$
default	$-\frac{a\ln\left(c^{2}e\,x^{2}+c^{2}d\right)}{2d}+\frac{a\ln\left(cx\right)}{d}+\frac{ib\,\mathrm{dilog}\left(icx+\sqrt{-c^{2}x^{2}+1}\right)}{d}+\frac{ib\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^{4}+\left(-4c^{2}d-2e\right)\_Z^{2}+e\right)}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d*ln(c^2*e*x^2+c^2*d)+a/d*ln(c*x)+I*b*dilog(I*c*x+(-c^2*x^2+1)^(1/2)
)/d+1/4*I*b*sum((-_R1^2*e+4*c^2*d+e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln
((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_
R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))/d+b/d*arcsin(c*x)*ln(1+I*c*x
+(-c^2*x^2+1)^(1/2))-I*b/d*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/4*I*b*sum((_
R1^2-1)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2
))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^
2*d-2*e)*_Z^2+e))*e/d
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(x^2*e + d)/d - 2*log(x)/d) + b*integrate(arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/(x^3*e + d*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^3*e + d*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x (d + ex^2)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(d + e*x**2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x\,\left(e\,x^2 + d\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d + e*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d + e*x^2)), x)
```

3.630 $\int \frac{a+b\text{ArcSin}(cx)}{x^2(d+ex^2)}\,dx$

Optimal. Leaf size=579

$$-\frac{a+b\text{ArcSin}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{\sqrt{e}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}-\frac{\sqrt{e}\,(a$$

```
[Out] (-a-b*arcsin(c*x))/d/x-b*c*arctanh((-c^2*x^2+1)^(1/2))/d+1/2*(a+b*arcsin(c*
x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)
))*e^(1/2)/(-d)^(3/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))
*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)+1/2*(a+b*arcs
in(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^
(1/2)))*e^(1/2)/(-d)^(3/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(
1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)+1/2*I*b*
polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/
2)))*e^(1/2)/(-d)^(3/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2
)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)+1/2*I*b*polylog(2,-(
I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)
/(-d)^(3/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^
(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)
```

Rubi [A]
time = 0.65, antiderivative size = 579, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.524$, Rules used = {4817, 4723, 272, 65, 214, 4757, 4825, 4617, 2221, 2317, 2438}

$$\frac{\sqrt{e}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}-\frac{\sqrt{e}\,(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}+\frac{\sqrt{e}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}-\frac{\sqrt{e}\,(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}-\frac{a+b\text{ArcSin}(cx)}{dx}+\frac{ib\sqrt{e}\,\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}-\frac{ib\sqrt{e}\,\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}+\frac{ib\sqrt{e}\,\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}-\frac{ib\sqrt{e}\,\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (Sqrt[e
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(3/2))
+ (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqr
t[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Lo
g[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d
)^(3/2)) + ((I/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*S
qrt[-d] - Sqrt[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(3/2) + ((I
/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt
[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(3/2)
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d+ex^2\right)}\,dx=\int \left(\frac{a+b\sin^{-1}(cx)}{dx^2}-\frac{e(a+b\sin^{-1}(cx))}{d\left(d+ex^2\right)}\right)\,dx$$

$$=\frac{\int \frac{a+b\sin^{-1}(cx)}{x^2}\,dx}{d}-\frac{e\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{d}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}+\frac{(bc)\int \frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d}-\frac{e\int \left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\sqrt{-d}\,(a+b}{2d\left(\sqrt{-d}-\right.}\right.}{d}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}+\frac{(bc)\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d}-\frac{e\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2(-d)^{3/2}}-$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{b\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{cd}-\frac{e\text{Subst}\left(\int \frac{(a+bx)\cos(}{c\sqrt{-d}-\sqrt{e}}\right.}{2(-}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}-\frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-}\right.}{2(-d)^{3/2}}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))\log\left(1-\frac{}{ic\sqrt{-}}\right.}{2(-d)^{3/2}}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))\log\left(1-\frac{}{ic\sqrt{-}}\right.}{2(-d)^{3/2}}$$

$$=-\frac{a+b\sin^{-1}(cx)}{dx}-\frac{bc\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))\log\left(1-\frac{}{ic\sqrt{-}}\right.}{2(-d)^{3/2}}$$

Mathematica [A]
time = 0.22, size = 455, normalized size = 0.79

$$\frac{-4a\sqrt{d}-4a\sqrt{e}\,x\text{ArcTan}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)-4b\sqrt{d}\left(\text{ArcSin}(cx)+cx\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)\right)+b\sqrt{e}\,x\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)-b\sqrt{e}\,x\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)}{4d^{3/2}x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)),x]
```

```
[Out] (-4*a*Sqrt[d] - 4*a*Sqrt[e]*x*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - 4*b*Sqrt[d]*(Ar
cSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]) + b*Sqrt[e]*x*(ArcSin[c*x]*(Arc
Sin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2
```

```
*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e
])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d
 + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*
d + e]))]) - b*Sqrt[e]*x*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(4*d^(3/2)*x)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 1.45, size = 369, normalized size = 0.64

method	result
derivativedivides	$c\left(-\frac{ae\arctan\left(\frac{ex}{\sqrt{de}}\right)}{cd\sqrt{de}}-\frac{a}{dcx}-\frac{b\arcsin(cx)}{dcx}+\frac{be\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{\left(4\_R1^2c^2d+\_\right.}{}\right.}{}\right.$
default	$c\left(-\frac{ae\arctan\left(\frac{ex}{\sqrt{de}}\right)}{cd\sqrt{de}}-\frac{a}{dcx}-\frac{b\arcsin(cx)}{dcx}+\frac{be\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{\left(4\_R1^2c^2d+\_\right.}{}\right.}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c*(-a/c*e/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-a/d/c/x-b/d*arcsin(c*x)/c/x
+1/8*b/c^2/d^2*e*sum((4*_R1^2*c^2*d+_R1^2*e-e)/_R1/(-_R1^2*e+2*c^2*d+e)*(I*
arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x
^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/8*b/c^2/d^2*
e*sum((-_R1^2*e+4*c^2*d+e)/_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-
I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_
R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)
-b/d*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -a*(arctan(x*e^(1/2)/sqrt(d))*e^(1/2)/d^(3/2) + 1/(d*x)) + b*integrate(arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^4*e + d*x^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^4*e + d*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x^2 (d + ex^2)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*(d + e*x**2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\, x)}{x^2\, (e\, x^2 + d)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d + e*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^2*(d + e*x^2)), x)
```

3.631 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d+ex^2)}\,dx$

Optimal. Leaf size=573

$$-\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\text{ArcSin}(cx)}{2dx^2}+\frac{e(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}+\frac{e(a+b\text{ArcSin}(cx))\,\mathrm{l}}{}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/d/x^2-e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(
1/2))^2)/d^2+1/2*e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2
)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*e*(a+b*arcsin(c*x))*ln(1+(I*c*x
+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*e*(a
+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^
2*d+e)^(1/2)))/d^2+1/2*e*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^2+1/2*I*b*e*polylog(2,(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/d^2-1/2*I*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^
(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*I*b*e*polylog(2,(I*c*x+(-c^
2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*I*b*e*pol
ylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2))
)/d^2-1/2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2
)+(c^2*d+e)^(1/2)))/d^2-1/2*b*c*(-c^2*x^2+1)^(1/2)/d/x
```

Rubi [A]
time = 0.67, antiderivative size = 573, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {4817, 4723, 270, 4721, 3798, 2221, 2317, 2438, 4825, 4617}

$$\frac{e(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{e(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{e(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{e(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{e\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}-\frac{a+b\text{ArcSin}(cx)}{2dx^2}-\frac{ibe\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2}-\frac{ibe\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2}-\frac{ibe\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2d^2}-\frac{ibe\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2d^2}+\frac{ibe\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{bc\sqrt{1-c^2x^2}}{2dx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) + (e*(a
+ b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[
c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*
Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d
^2) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[
-d] + Sqrt[c^2*d + e])])/(2*d^2) - (e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*
ArcSin[c*x])])/d^2 - ((I/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/d^2 - ((I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^2 - ((I/2)*b*e*PolyLog[
2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^2 -
((I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*
d + e])])/d^2 + ((I/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{dx^3} - \frac{e(a+b\sin^{-1}(cx))}{d^2x} + \frac{e^2x(a+b\sin^{-1}(cx))}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^3}\,dx}{d} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^2} + \frac{e^2\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d} - \frac{e\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \sin^{-1}\right.}{d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{ie(a+b\sin^{-1}(cx))^2}{2bd^2} + \frac{(2ie)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\right.}{d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{ie(a+b\sin^{-1}(cx))^2}{2bd^2} - \frac{e(a+b\sin^{-1}(cx))\log\left(\right.}{d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} - \frac{e(a+b\sin^{-1}(cx))\log\left(1-e^{2i\sin^{-1}(cx)}\right)}{d^2} - \frac{(ibe}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{e(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right.}{2d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{e(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right.}{2d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\sin^{-1}(cx)}{2dx^2} + \frac{e(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right.}{2d^2}$$

Mathematica [A]

time = 1.47, size = 483, normalized size = 0.84

$$\frac{-\frac{4ad}{x^2} - 8ae\log(x) + 4ae\log\left(d+ex^2\right) + 2b\left(-\frac{2cd\sqrt{1-c^2x^2}}{x} - \frac{2d\text{ArcSin}(cx)}{x^2} + 4ie\text{ArcSin}\left(\sqrt{-\frac{c^2d}{e}}\right)\text{ArcTan}\left(\frac{\sqrt{c^2d\left(c^2d+e\right)}\,x}{cd\sqrt{1-c^2x^2}}\right) - 4e\text{ArcSin}(cx)\log\left(1-e^{2i\text{ArcSin}(cx)}\right) + 2e\text{ArcSin}\left(\sqrt{-\frac{c^2d}{e}}\right)\log\left(1-\frac{\left(2c^2d+e-2\sqrt{c^2d\left(c^2d+e\right)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) + 2e\text{ArcSin}(cx)\log\left(1-\frac{\left(2c^2d+e-2\sqrt{c^2d\left(c^2d+e\right)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) - 2e\text{ArcSin}\left(\sqrt{-\frac{c^2d}{e}}\right)\log\left(1-\frac{\left(2c^2d+e+2\sqrt{c^2d\left(c^2d+e\right)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) + 2e\text{ArcSin}(cx)\log\left(1-\frac{\left(2c^2d+e+2\sqrt{c^2d\left(c^2d+e\right)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) + 2ie\text{PolyLog}\left(2,e^{2i\text{ArcSin}(cx)}\right) - ie\text{PolyLog}\left(2,\frac{\left(2c^2d+e-2\sqrt{c^2d\left(c^2d+e\right)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right) - ie\text{PolyLog}\left(2,\frac{\left(2c^2d+e+2\sqrt{c^2d\left(c^2d+e\right)}\right)e^{2i\text{ArcSin}(cx)}}{e}\right)\right)}{8d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] ((-4*a*d)/x^2 - 8*a*e*Log[x] + 4*a*e*Log[d + e*x^2] + 2*b*((-2*c*d*Sqrt[1 -
 c^2*x^2])/x - (2*d*ArcSin[c*x])/x^2 + (4*I)*e*ArcSin[Sqrt[-((c^2*d)/e)]]*A
rcTan[(Sqrt[c^2*d*(c^2*d + e)]*x)/(c*d*Sqrt[1 - c^2*x^2])] - 4*e*ArcSin[c*x
]*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*e*ArcSin[Sqrt[-((c^2*d)/e)]]*Log[1 - (
```

```
(2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + 2*e*A
rcSin[c*x]*Log[1 - ((2*c^2*d + e - 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcS
in[c*x]))/e] - 2*e*ArcSin[Sqrt[-((c^2*d)/e)]]*Log[1 - ((2*c^2*d + e + 2*Sqr
t[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + 2*e*ArcSin[c*x]*Log[1 - (
(2*c^2*d + e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] + (2*I)
*e*PolyLog[2, E^((2*I)*ArcSin[c*x])] - I*e*PolyLog[2, ((2*c^2*d + e - 2*Sqr
t[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e] - I*e*PolyLog[2, ((2*c^2*d
+ e + 2*Sqrt[c^2*d*(c^2*d + e)])*E^((2*I)*ArcSin[c*x]))/e]))/(8*d^2)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.46, size = 446, normalized size = 0.78

method	result
derivativedivides	$c^2\left(\frac{ae\ln(c^2ex^2+c^2d)}{2c^2d^2}-\frac{a}{2d\,c^2x^2}-\frac{ae\ln(cx)}{c^2d^2}+\frac{ib}{2d}-\frac{b\sqrt{-c^2x^2+1}}{2dcx}-\frac{b\arcsin(cx)}{2d\,c^2x^2}-\frac{ibe\,\mathrm{dilog}\left(icx+\sqrt{-\right.}}{c^2d^2}\right.$
default	$c^2\left(\frac{ae\ln(c^2ex^2+c^2d)}{2c^2d^2}-\frac{a}{2d\,c^2x^2}-\frac{ae\ln(cx)}{c^2d^2}+\frac{ib}{2d}-\frac{b\sqrt{-c^2x^2+1}}{2dcx}-\frac{b\arcsin(cx)}{2d\,c^2x^2}-\frac{ibe\,\mathrm{dilog}\left(icx+\sqrt{-\right.}}{c^2d^2}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(1/2*a/c^2*e/d^2*ln(c^2*e*x^2+c^2*d)-1/2*a/d/c^2/x^2-a/c^2/d^2*e*ln(c*x
)+1/2*I*b/d-1/2*b/d/c/x*(-c^2*x^2+1)^(1/2)-1/2*b*arcsin(c*x)/d/c^2/x^2-I*b/
c^2/d^2*e*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-1/4*I*b/c^2/d^2*e*sum((-_R1^2*e+4
*c^2*d+e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1
/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*
c^2*d-2*e)*_Z^2+e))-b/c^2/d^2*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+
I*b/c^2/d^2*e*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/4*I*b/c^2/d^2*e^2*sum((_R
1^2-1)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2)
)/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2
*d-2*e)*_Z^2+e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(e*log(x^2*e + d)/d^2 - 2*e*log(x)/d^2 - 1/(d*x^2)) + b*integrate(arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^5*e + d*x^3), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^5*e + d*x^3), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\operatorname{asin}(cx)}{x^3 (d + ex^2)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**3*(d + e*x**2)), x)
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\operatorname{asin}(c\,x)}{x^3\,(e\,x^2 + d)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d + e*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^3*(d + e*x^2)), x)
```

3.632 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x^4(d+ex^2)}\,dx$

Optimal. Leaf size=649

$$-\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{a+b\text{ArcSin}(cx)}{3dx^3}+\frac{e(a+b\text{ArcSin}(cx))}{d^2x}-\frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d}+\frac{bce\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d^2}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3+e*(a+b*arcsin(c*x))/d^2/x-1/6*b*c^3*arctanh((-
c^2*x^2+1)^(1/2))/d+b*c*e*arctanh((-c^2*x^2+1)^(1/2))/d^2+1/2*e^(3/2)*(a+b*
arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d
+e)^(1/2)))/(-d)^(5/2)-1/2*e^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(5/2)+1/2*e^(3/2)*
(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(
c^2*d+e)^(1/2)))/(-d)^(5/2)-1/2*e^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)+1/2*I*b
*e^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))/(-d)^(5/2)-1/2*I*b*e^(3/2)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(5/2)+1/2*I*b*e^(3/2)*pol
ylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2))
)/(-d)^(5/2)-1/2*I*b*e^(3/2)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(
I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)-1/6*b*c*(-c^2*x^2+1)^(1/2)/d/x^
2
```

Rubi [A]
time = 0.70, antiderivative size = 649, normalized size of antiderivative = 1.00, number of steps used = 29, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {4817, 4723, 272, 44, 65, 214, 4757, 4825, 4617, 2221, 2317, 2438}

$$\frac{e^{3/2}(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}-\frac{e^{3/2}(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}+\frac{e^{3/2}(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}-\frac{e^{3/2}(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}}+\frac{e(a+b\text{ArcSin}(cx))}{d^2x}-\frac{a+b\text{ArcSin}(cx)}{3dx^3}+\frac{ibe^{3/2}\text{Li}_2\left(-\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}}-\frac{ibe^{3/2}\text{Li}_2\left(\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}}+\frac{ibe^{3/2}\text{Li}_2\left(-\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}}-\frac{ibe^{3/2}\text{Li}_2\left(\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}}+\frac{bce\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d^2}-\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d + e*x^2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[1 - c^2*x^2])/(d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) + (e*(
a + b*ArcSin[c*x]))/(d^2*x) - (b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (b
*c*e*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 + (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/
2)) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + (e^(3/2)*(a + b*ArcSin[c*x]
)*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2
*(-d)^(5/2)) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*
x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + ((I/2)*b*e^(3/2)*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])
```

```
/(-d)^(5/2) - ((I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) + ((I/2)*b*e^(3/2)*PolyLog[2, -((S
qrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(-d)^(5/2) -
((I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqr
t[c^2*d + e])])/(-d)^(5/2)
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^4\left(d+ex^2\right)}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{dx^4} - \frac{e(a+b\sin^{-1}(cx))}{d^2x^2} + \frac{e^2(a+b\sin^{-1}(cx))}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^4}\,dx}{d} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e(a+b\sin^{-1}(cx))}{d^2x} + \frac{(bc)\int \frac{1}{x^3\sqrt{1-c^2x^2}}\,dx}{3d} - \frac{(bce)\int \frac{1}{x\sqrt{1-\ldots}}}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e(a+b\sin^{-1}(cx))}{d^2x} + \frac{(bc)\text{Subst}\left(\int \frac{1}{x^2\sqrt{1-c^2x}}\,dx, x, x^2\right)}{6d} - \ldots$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e(a+b\sin^{-1}(cx))}{d^2x} + \frac{(bc^3)\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2\ldots}}\right.}{12d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e(a+b\sin^{-1}(cx))}{d^2x} + \frac{bce\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{d^2}\ldots$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e(a+b\sin^{-1}(cx))}{d^2x} - \frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d}\ldots$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e(a+b\sin^{-1}(cx))}{d^2x} - \frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d}\ldots$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\sin^{-1}(cx)}{3dx^3} + \frac{e(a+b\sin^{-1}(cx))}{d^2x} - \frac{bc^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6d}\ldots$$

<u>Mathematica</u> [A]
time = 0.25, size = 531, normalized size = 0.82

$$-\frac{a}{3dx^3} + \frac{ae}{d^2x} + \frac{ae^{3/2}\text{ArcTan}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} + b\left(-\frac{e\left(-\frac{\text{ArcSin}(cx)}{x} - c\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)\right)}{d^2} - \frac{cx\sqrt{1-c^2x^2} + 2\text{ArcSin}(cx) + c^3x^3\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)}{6dx^3} - \frac{e^{3/2}\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx) + 2i\left(\log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right) + \log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right) + 2\text{PolyLog}\left(2, \frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right) + 2\text{PolyLog}\left(2, -\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)}{4d^{5/2}} + \frac{e^{3/2}\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx) + 2i\left(\log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right) + \log\left(1-\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right) + 2\text{PolyLog}\left(2, \frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right) + 2\text{PolyLog}\left(2, \frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)}{4d^{5/2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d + e*x^2)),x]
```

```
[Out] -1/3*a/(d*x^3) + (a*e)/(d^2*x) + (a*e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/d^
(5/2) + b*(-((e*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1 - c^2*x^2]]))/d^2) - (
c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]])
```

```
/(6*d*x^3) - (e^(3/2)*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^
(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))/(4*d^(5/2)) + (e^(3/2)*(
ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*
Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])]))/(4*d^(5/2)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 1.35, size = 488, normalized size = 0.75

method	result
derivativedivides	$c^3\left(\frac{a\,e^2 \arctan\left(\frac{ex}{\sqrt{de}}\right)}{c^3 d^2\sqrt{de}}-\frac{a}{3d\,c^3x^3}+\frac{ae}{c^3d^2x}-\frac{b\sqrt{-c^2x^2+1}}{6d\,c^2x^2}-\frac{b\arcsin(cx)}{3d\,c^3x^3}+\frac{b\arcsin(cx)e}{c^3d^2x}-\frac{b\,e^2\left(\ldots\right.}{\ldots}\right.$
default	$c^3\left(\frac{a\,e^2 \arctan\left(\frac{ex}{\sqrt{de}}\right)}{c^3 d^2\sqrt{de}}-\frac{a}{3d\,c^3x^3}+\frac{ae}{c^3d^2x}-\frac{b\sqrt{-c^2x^2+1}}{6d\,c^2x^2}-\frac{b\arcsin(cx)}{3d\,c^3x^3}+\frac{b\arcsin(cx)e}{c^3d^2x}-\frac{b\,e^2\left(\ldots\right.}{\ldots}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^4/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(a/c^3*e^2/d^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/3*a/d/c^3/x^3+a/c^
3/d^2*e/x-1/6*b/d/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/3*b/d*arcsin(c*x)/c^3/x^3+b/
c^3*arcsin(c*x)/d^2*e/x-1/8*b/c^4/d^3*e^2*sum((-_R1^2*e+4*c^2*d+e)/_R1/(-_R
1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilo
g((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^
2+e))+1/6*b/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-1/6*b/d*ln(1+I*c*x+(-c^2*x^2+1
)^(1/2))-1/8*b/c^4/d^3*e^2*sum((4*_R1^2*c^2*d+_R1^2*e-e)/_R1/(-_R1^2*e+2*c^
2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c
*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-b/c^
2/d^2*e*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+b/c^2/d^2*e*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="maxima")
[Out] 1/3*a*(3*arctan(x*e^(1/2)/sqrt(d))*e^(3/2)/d^(5/2) + (3*x^2*e - d)/(d^2*x^3
)) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^6*e + d*x^4)
, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(x^6*e + d*x^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x^4 (d + ex^2)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**4/(e*x**2+d),x)
[Out] Integral((a + b*asin(c*x))/(x**4*(d + e*x**2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x^4), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x^4\,(e\,x^2 + d)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^4*(d + e*x^2)),x)
[Out] int((a + b*asin(c*x))/(x^4*(d + e*x^2)), x)
```

3.633 $\int \frac{x^3(a+b\mathbf{ArcSin}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=574

$$\frac{d(a+b\text{ArcSin}(cx))}{2e^2(d+ex^2)}-\frac{i(a+b\text{ArcSin}(cx))^2}{2be^2}-\frac{bc\sqrt{d}\,\text{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}+\frac{(a+b\text{ArcSin}(cx))\log\left(1-\right.}{2e^2}$$

```
[Out] 1/2*d*(a+b*arcsin(c*x))/e^2/(e*x^2+d)-1/2*I*(a+b*arcsin(c*x))^2/b/e^2+1/2*(
a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c
^2*d+e)^(1/2)))/e^2+1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e
^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2+1/2*(a+b*arcsin(c*x))*ln(1-(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2+1/2*(
a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c
^2*d+e)^(1/2)))/e^2-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(
I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^
(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*I*b*polylog(2,-(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2-1/2*I
*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(
1/2)))/e^2-1/2*b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))*d^(
1/2)/e^2/(c^2*d+e)^(1/2)
```

Rubi [A]
time = 0.70, antiderivative size = 574, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {4817, 4813, 385, 211, 4825, 4617, 2221, 2317, 2438}

$$\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}+\frac{d(a+b\text{ArcSin}(cx))}{2e^2(d+ex^2)}-\frac{i(a+b\text{ArcSin}(cx))^2}{2be^2}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e^2}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2e^2}-\frac{bc\sqrt{d}\,\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (d*(a + b*ArcSin[c*x]))/(2*e^2*(d + e*x^2)) - ((I/2)*(a + b*ArcSin[c*x])^2)
/(b*e^2) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^
2])])/(2*e^2*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c
*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])
/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) - ((I/2)*b*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])
/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
[c^2*d + e])])/e^2 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
```

```
*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^2
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
```

```
x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx = \int \left(-\frac{dx(a+b\sin^{-1}(cx))}{e\,(d+ex^2)^2}+\frac{x(a+b\sin^{-1}(cx))}{e\,(d+ex^2)}\right)\,dx$$

$$= \frac{\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{e}-\frac{d\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx}{e}$$

$$= \frac{d(a+b\sin^{-1}(cx))}{2e^2\,(d+ex^2)}-\frac{(bcd)\int \frac{1}{\sqrt{1-c^2x^2}\,(d+ex^2)}\,dx}{2e^2}+\frac{\int \left(-\frac{a+b\sin^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)}\right.}{}$$

$$= \frac{d(a+b\sin^{-1}(cx))}{2e^2\,(d+ex^2)}-\frac{(bcd)\text{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{2e^2}-\frac{\int \frac{a+b\,\text{si}}{\sqrt{-d}}}{2}$$

$$= \frac{d(a+b\sin^{-1}(cx))}{2e^2\,(d+ex^2)}-\frac{bc\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}-\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(}{c\sqrt{-d}-\sqrt{e}}\right.}{2e}$$

$$= \frac{d(a+b\sin^{-1}(cx))}{2e^2\,(d+ex^2)}-\frac{i(a+b\sin^{-1}(cx))^2}{2be^2}-\frac{bc\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}-$$

$$= \frac{d(a+b\sin^{-1}(cx))}{2e^2\,(d+ex^2)}-\frac{i(a+b\sin^{-1}(cx))^2}{2be^2}-\frac{bc\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}+$$

$$= \frac{d(a+b\sin^{-1}(cx))}{2e^2\,(d+ex^2)}-\frac{i(a+b\sin^{-1}(cx))^2}{2be^2}-\frac{bc\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}+$$

$$= \frac{d(a+b\sin^{-1}(cx))}{2e^2\,(d+ex^2)}-\frac{i(a+b\sin^{-1}(cx))^2}{2be^2}-\frac{bc\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}+$$

__Mathematica__ [A]
time = 0.74, size = 593, normalized size = 1.03

$$\frac{\frac{2ad}{d+ex^2}+2a\log(d+ex^2)+b\left(\sqrt{d}\left(\frac{\text{ArcSin}(cx)}{\sqrt{d}+i\sqrt{e}\,x}-\frac{c\,\text{ArcTan}\left(\frac{i\sqrt{e}+c^2\sqrt{d}\,x}{\sqrt{c^2d+e}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)-i\sqrt{d}\left(-\frac{\text{ArcSin}(cx)}{i\sqrt{d}+\sqrt{e}\,x}-\frac{c\tanh^{-1}\left(\frac{\sqrt{e}+ic^2\sqrt{d}\,x}{\sqrt{c^2d+e}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)-i\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)-i\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)}{4e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] ((2*a*d)/(d + e*x^2) + 2*a*Log[d + e*x^2] + b*(Sqrt[d]*(ArcSin[c*x]/(Sqrt[d
] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*S
```

```
qrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - I*Sqrt[d]*(-(ArcSin[c*x]/(I*Sqrt[d]
+ Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - I*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 +
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2
, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog
[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) - I*(Arc
Sin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqr
t[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
+ Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
 - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
+ Sqrt[c^2*d + e])])))/(4*e^2)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.87, size = 2962, normalized size = 5.16

method	result	size
derivativedivides	Expression too large to display	2962
default	Expression too large to display	2962

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(1/2*b*c^6*arcsin(c*x)/e^2*d/(c^2*e*x^2+c^2*d)+I*b*c^10*d^3*polylog(2
,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^4/
(c^2*d+e)+1/2*b*c^4*(d*c^2*(c^2*d+e))^(1/2)/(c^2*d+e)/e^2*arcsin(c*x)*ln(1-
e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))-3/2*b
*c^4*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)
+e))*arcsin(c*x)/e^2/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-2*b*c^10*d^3*ln(1-e*
(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(
c*x)/e^4/(c^2*d+e)-4*b*c^8*d^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d
-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^3/(c^2*d+e)-5/2*b*c^6*ln(1-e*(
I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c
*x)/e^2/(c^2*d+e)*d+2*b*c^6*d*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-
2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^4*(d*c^2*(c^2*d+e))^(1/2)-1/2*I
*b*c^4*(d*c^2*(c^2*d+e))^(1/2)/(c^2*d+e)/e^2*arctanh(1/4*(4*c^2*d-2*e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2+2*e)/(c^4*d^2+c^2*d*e)^(1/2))+2*I*b*c^10*d^3*arcsin
(c*x)^2/e^4/(c^2*d+e)+4*I*b*c^8*d^2*arcsin(c*x)^2/e^3/(c^2*d+e)+2*I*b*c^8*d
^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1
/2)+e))/e^3/(c^2*d+e)-1/4*I*b*c^4*(d*c^2*(c^2*d+e))^(1/2)/(c^2*d+e)/e^2*pol
ylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)
)+5/2*I*b*c^6*arcsin(c*x)^2/e^2/(c^2*d+e)*d+I*b*c^4*(d*c^2*(c^2*d+e))^(1/2)
/(c^2*d+e)/e^2*arcsin(c*x)^2-2*I*b*c^6*arcsin(c*x)^2*d/e^4*(d*c^2*(c^2*d+e)
)^(1/2)+5/4*I*b*c^6*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*
c^2*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)*d+3/4*I*b*c^4*polylog(2,e*(I*c*x+(-c
```

```
^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)*(d*
c^2*(c^2*d+e))^(1/2)-I*b*c^6*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^
2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*d/e^4*(d*c^2*(c^2*d+e))^(1/2)-2*b*c^8*d^2
*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))
*arcsin(c*x)/e^4/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-3*b*c^6*d*ln(1-e*(I*c*x+
(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^
3/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-1/4*b*c^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1
/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/d/(c^2*d+e)/e*(d*
c^2*(c^2*d+e))^(1/2)+I*b*c^8*d^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(
2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^4/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)
+1/4*b*c^2*(d*c^2*(c^2*d+e))^(1/2)/e/d/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+
(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))+1/8*I*b*c^2*po
lylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e
))/d/(c^2*d+e)/e*(d*c^2*(c^2*d+e))^(1/2)+2*I*b*c^8*d^2*arcsin(c*x)^2/e^4/(c
^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)+3*I*b*c^6*d*arcsin(c*x)^2/e^3/(c^2*d+e)*(d*
c^2*(c^2*d+e))^(1/2)+3/2*I*b*c^6*d*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2
/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/
2)-1/8*I*b*c^2*(d*c^2*(c^2*d+e))^(1/2)/e/d/(c^2*d+e)*polylog(2,e*(I*c*x+(-c
^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))+1/2*a*c^4/e^2*ln(
c^2*e*x^2+c^2*d)+1/2*a*c^6/e^2*d/(c^2*e*x^2+c^2*d)+1/2*b*c^4*ln(1-e*(I*c*x+
(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^
2-1/4*I*b*c^4*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c
^2*d+e))^(1/2)+e))/e^2-I*b*c^4*arcsin(c*x)^2/e^2-1/2*I*b*c^4/e^2*sum((-_R1^
2*e+4*c^2*d+2*e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^
2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z
^4+(-4*c^2*d-2*e)*_Z^2+e))+2*b*c^6*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c
^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^3*d+2*b*c^8*d^2*ln(1-e*(I*
c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x
)/e^4-1/2*b*c^4*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*
d+e))^(1/2)+e))*arcsin(c*x)/(c^2*d+e)/e-I*b*c^8*polylog(2,e*(I*c*x+(-c^2*x^
2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*d^2/e^4-I*b*c^6*polylo
g(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*d
/e^3-1/2*I*b*c^4*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2
*(c^2*d+e))^(1/2)+e))/e^3*(d*c^2*(c^2*d+e))^(1/2)-I*b*c^4*arcsin(c*x)^2/e^3
*(d*c^2*(c^2*d+e))^(1/2)-2*I*b*c^6*arcsin(c*x)^2/e^3*d-2*I*b*c^8*arcsin(c*x
)^2*d^2/e^4+1/2*I*b*c^4*arcsin(c*x)^2/(c^2*d+e)/e+1/4*I*b*c^4*polylog(2,e*(
I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/(c^2*d+e
)/e+b*c^4*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^
(1/2)+e))*arcsin(c*x)/e^3*(d*c^2*(c^2*d+e))^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(e^(-2)*log(x^2*e + d) + d/(x^2*e^3 + d*e^2))*a + b*integrate(x^3*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^4*e^2 + 2*d*x^2*e + d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(x^4*e^2 + 2*d*x^2*e + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(a + b\operatorname{asin}(cx))}{(d + ex^2)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.634 $\int \frac{x(a+b\text{ArcSin}(cx))}{(d+ex^2)^2} dx$

Optimal. Leaf size=86

$$\frac{-a-b\text{ArcSin}(cx)}{2e(d+ex^2)}+\frac{bc\text{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}\,e\sqrt{c^2d+e}}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/e/(e*x^2+d)+1/2*b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)
/(-c^2*x^2+1)^(1/2))/e/d^(1/2)/(c^2*d+e)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 83, normalized size of antiderivative = 0.97, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4813, 385, 211}

$$\frac{bc\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}\,e\sqrt{c^2d+e}}-\frac{a+b\text{ArcSin}(cx)}{2e(d+ex^2)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -1/2*(a + b*ArcSin[c*x])/(e*(d + e*x^2)) + (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/
(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*Sqrt[d]*e*Sqrt[c^2*d + e])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx = -\frac{a+b\sin^{-1}(cx)}{2e\,(d+ex^2)} + \frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}\,(d+ex^2)}\,dx}{2e}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2e\,(d+ex^2)} + \frac{(bc)\text{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,dx, x, \frac{x}{\sqrt{1-c^2x^2}}\right)}{2e}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2e\,(d+ex^2)} + \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}\,e\sqrt{c^2d+e}}$$

Mathematica [A]
time = 0.10, size = 87, normalized size = 1.01

$$-\frac{\frac{a}{d+ex^2} + \frac{b\text{ArcSin}(cx)}{d+ex^2} - \frac{bc\text{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{d}\,\sqrt{c^2d+e}}}{2e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -1/2*(a/(d + e*x^2) + (b*ArcSin[c*x])/(d + e*x^2) - (b*c*ArcTan[(Sqrt[c^2*d
 + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(Sqrt[d]*Sqrt[c^2*d + e]))/e
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 417 vs. 2(72) = 144.
time = 2.12, size = 418, normalized size = 4.86

method	result
derivativedivides	$-\frac{a c^4}{2e\left(c^2 e x^2+c^2 d\right)}-\frac{b c^4 \arcsin(cx)}{2\left(c^2 e x^2+c^2 d\right)e}-\frac{b c^4 \ln\left(\frac{\frac{2c^2 d+2e}{e}-\frac{2\sqrt{-c^2 e d}\left(cx-\frac{\sqrt{-c^2 e d}}{e}\right)}{e}+2\sqrt{\frac{c^2 d+e}{e}}\sqrt{-\left(cx-\right.}}{cx-\frac{\sqrt{-c^2 e}}{e}}\right.}{4e\sqrt{-c^2 e d}\sqrt{c^2}}$

default	$-\frac{a\,c^{4}}{2e\left(c^{2}e\,x^{2}+c^{2}d\right)}-\frac{b\,c^{4}\arcsin(cx)}{2\left(c^{2}e\,x^{2}+c^{2}d\right)e}-\frac{b\,c^{4}\ln\left(\frac{\frac{2c^{2}d+2e}{e}-\frac{2\sqrt{-c^{2}ed}\left(cx-\frac{\sqrt{-c^{2}ed}}{e}\right)}{e}+2\sqrt{\frac{c^{2}d+e}{e}}\sqrt{-\left(cx-\ldots\right.}}{cx-\frac{\sqrt{-c\ldots}}{e}}\right.}{4e\sqrt{-c^{2}ed}\sqrt{\ldots}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/2*a*c^4/e/(c^2*e*x^2+c^2*d)-1/2*b*c^4/(c^2*e*x^2+c^2*d)*arcsin(c*
x)/e-1/4*b*c^4/e/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(
-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c
^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/
e)^(1/2))/(c*x-(-c^2*e*d)^(1/2)/e))+1/4*b*c^4/e/(-c^2*e*d)^(1/2)/((c^2*d+e)
/e)^(1/2)*ln((2*(c^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2
*((c^2*d+e)/e)^(1/2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x
+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*(2*(c*x^2*e^2 + c*d*e)*integrate(1/2*e^(1/2*log(c*x + 1) + 1/2*log(-c*
x + 1))/(c^4*x^6*e^2 - c^2*d*x^2*e + (c^4*d*e - c^2*e^2)*x^4 + (c^2*x^4*e^2
 + (c^2*d*e - e^2)*x^2 - d*e)*e^(log(c*x + 1) + log(-c*x + 1))), x) + arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(x^2*e^2 + d*e) - 1/2*a/(x^2*e^2 +
 d*e)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 188 vs. 2(70) = 140.
time = 2.03, size = 417, normalized size = 4.85

$$\left[-\frac{4\,ac^{2}d^{2}+4\,ade+\left(bcx^{2}e+bcd\right)\sqrt{-c^{2}d^{2}-de}\,\log\left(\frac{8\,c^{4}d^{2}x^{4}-8\,c^{2}d^{2}x^{2}+x^{4}e^{2}-4\,\left(2\,c^{2}dx^{3}+x^{3}e-dx\right)\sqrt{-c^{2}d^{2}-de}\,\sqrt{-c^{2}x^{2}+1}+d^{2}+2\,\left(4\,c^{2}dx^{4}-3\,dx^{2}\right)e}{x^{4}e^{2}+2\,dx^{2}e+d^{2}}\right)+4\,\left(bc^{2}d^{2}+bde\right)\arcsin\left(cx\right)}{8\,\left(c^{2}d^{3}e+dx^{2}e^{3}+\left(c^{2}d^{2}x^{2}+d^{2}\right)e^{2}\right)},\ -\frac{2\,ac^{2}d^{2}+2\,ade+\left(bcx^{2}e+bcd\right)\sqrt{c^{2}d^{2}+de}\,\arctan\left(\frac{\left(2\,c^{2}dx^{2}+x^{2}e-d\right)\sqrt{c^{2}d^{2}+de}\,\sqrt{-c^{2}x^{2}+1}}{2\,\left(c^{4}d^{2}x^{3}-c^{2}d^{2}x+\left(c^{2}dx^{3}-dx\right)e\right)}\right)+2\,\left(bc^{2}d^{2}+bde\right)\arcsin\left(cx\right)}{4\,\left(c^{2}d^{3}e+dx^{2}e^{3}+\left(c^{2}d^{2}x^{2}+d^{2}\right)e^{2}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] [-1/8*(4*a*c^2*d^2 + 4*a*d*e + (b*c*x^2*e + b*c*d)*sqrt(-c^2*d^2 - d*e)*log
((8*c^4*d^2*x^4 - 8*c^2*d^2*x^2 + x^4*e^2 - 4*(2*c^2*d*x^3 + x^3*e - d*x)*s
qrt(-c^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1) + d^2 + 2*(4*c^2*d*x^4 - 3*d*x^2)*e)
/(x^4*e^2 + 2*d*x^2*e + d^2)) + 4*(b*c^2*d^2 + b*d*e)*arcsin(c*x))/(c^2*d^3
*e + d*x^2*e^3 + (c^2*d^2*x^2 + d^2)*e^2), -1/4*(2*a*c^2*d^2 + 2*a*d*e + (b
*c*x^2*e + b*c*d)*sqrt(c^2*d^2 + d*e)*arctan(1/2*(2*c^2*d*x^2 + x^2*e - d)*
sqrt(c^2*d^2 + d*e)*sqrt(-c^2*x^2 + 1)/(c^4*d^2*x^3 - c^2*d^2*x + (c^2*d*x^
3 - d*x)*e)) + 2*(b*c^2*d^2 + b*d*e)*arcsin(c*x))/(c^2*d^3*e + d*x^2*e^3 +
(c^2*d^2*x^2 + d^2)*e^2)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a + b\,\mathrm{asin}\,(cx))}{(d + ex^2)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d)**2,x)
[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a + b\,\mathrm{asin}(c\,x))}{(e\,x^2 + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
[Out] int((x*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.635 $\int \frac{a+b\textbf{ArcSin}(cx)}{x(d+ex^2)^2}\,dx$

Optimal. Leaf size=597

$$\frac{a+b\text{ArcSin}(cx)}{2d\,(d+ex^2)}-\frac{bc\text{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}}-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}-\frac{(a+b$$

```
[Out] 1/2*(a+b*arcsin(c*x))/d/(e*x^2+d)+(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1
)^(1/2))^2)/d^2-1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/
2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*(a+b*
arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))/d^2-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/
2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^2-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/d^2+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*
c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*I*b*polylog(2,-(I*c*
x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^2+1/2*I*b
*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/
2)))/d^2-1/2*b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(3/
2)/(c^2*d+e)^(1/2)
```

Rubi [A]
time = 0.72, antiderivative size = 597, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.524$, Rules used = {4817, 4721, 3798, 2221, 2317, 2438, 4813, 385, 211, 4825, 4617}

$$-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2}+\frac{\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^2}+\frac{a+b\text{ArcSin}(cx)}{2d\,(d+ex^2)}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2d^2}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2d^2}-\frac{ib\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{2d^2}-\frac{bc\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2),x]
```

```
[Out] (a + b*ArcSin[c*x])/(2*d*(d + e*x^2)) - (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sq
rt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x
])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(
2*d^2) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcS
in[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e
])])/(2*d^2) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^2 + (
(I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
 + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] - Sqrt[c^2*d + e])])/d^2 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*
```

```
x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^2 - ((I/2)*b*PolyL
og[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
```

```
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)^2}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{d^2x} - \frac{ex(a+b\sin^{-1}(cx))}{d\left(d+ex^2\right)^2} - \frac{ex(a+b\sin^{-1}(cx))}{d^2\left(d+ex^2\right)}\right)\,dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^2} - \frac{e\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{d^2} - \frac{e\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx}{d}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} + \frac{\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \sin^{-1}(cx)\right)}{d^2} - \frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}\,(d+ex}}{2d}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{i(a+b\sin^{-1}(cx))^2}{2bd^2} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \sin^{-1}(cx)\right)}{d^2} - \frac{(b}{}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{i(a+b\sin^{-1}(cx))^2}{2bd^2} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} + \frac{(a+b\sin^{-1}(}{}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} + \frac{(a+b\sin^{-1}(cx))\log\left(1-e^{2i\sin^{-1}(c}\right.}{d^2}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} - \frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e}{ic\sqrt{-d}\,-}\right.}{2d^2}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} - \frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e}{ic\sqrt{-d}\,-}\right.}{2d^2}$$

$$= \frac{a+b\sin^{-1}(cx)}{2d\left(d+ex^2\right)} - \frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} - \frac{(a+b\sin^{-1}(cx))\log\left(1-\frac{\sqrt{e}\,e}{ic\sqrt{-d}\,-}\right.}{2d^2}$$

Mathematica [F]
time = 2.31, size = 0, normalized size = 0.00

$$\int \frac{a+b\text{ArcSin}(cx)}{x\left(d+ex^2\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2),x]
[Out] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2), x]
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.46, size = 488, normalized size = 0.82

method	result
derivativedivides	$\frac{a c^2}{2d(c^2 e x^2+c^2 d)} - \frac{a \ln(c^2 e x^2+c^2 d)}{2d^2} + \frac{a \ln(cx)}{d^2} + \frac{b c^2 \arcsin(cx)}{2d(c^2 e x^2+c^2 d)} - \frac{ib\sqrt{d c^2 (c^2 d+e)}\ \operatorname{arctanh}\left(\frac{4c^2 d-2e(}{}\right.}{2d^2(c^2 d+e)}$
default	$\frac{a c^2}{2d(c^2 e x^2+c^2 d)} - \frac{a \ln(c^2 e x^2+c^2 d)}{2d^2} + \frac{a \ln(cx)}{d^2} + \frac{b c^2 \arcsin(cx)}{2d(c^2 e x^2+c^2 d)} - \frac{ib\sqrt{d c^2 (c^2 d+e)}\ \operatorname{arctanh}\left(\frac{4c^2 d-2e(}{}\right.}{2d^2(c^2 d+e)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a*c^2/d/(c^2*e*x^2+c^2*d)-1/2*a/d^2*ln(c^2*e*x^2+c^2*d)+a/d^2*ln(c*x)+1
/2*b*c^2*arcsin(c*x)/d/(c^2*e*x^2+c^2*d)-1/2*I*b*(d*c^2*(c^2*d+e))^(1/2)/d^
2/(c^2*d+e)*arctanh(1/4*(4*c^2*d-2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2+2*e)/(c^4
*d^2+c^2*d*e)^(1/2))+I*b/d^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+1/4*I*b/d^2*su
m((-_R1^2*e+4*c^2*d+e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+b/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))-I*b/d^2*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/4*I*b/d^2*sum((_R1^2-1)/
(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+
dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)
*_Z^2+e))*e
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(1/(d*x^2*e + d^2) - log(x^2*e + d)/d^2 + 2*log(x)/d^2) + b*integrate
(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^5*e^2 + 2*d*x^3*e + d^2*x),
x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^5*e^2 + 2*d*x^3*e + d^2*x), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x(d + ex^2)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(d + e*x**2)**2), x)
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x\,(e\,x^2 + d)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d + e*x^2)^2), x)
```

3.636 $\int \frac{a+b\text{ArcSin}(cx)}{x^3(d+ex^2)^2}\,dx$

Optimal. Leaf size=632

$$-\frac{bc\sqrt{1-c^2x^2}}{2d^2x}-\frac{a+b\text{ArcSin}(cx)}{2d^2x^2}-\frac{e(a+b\text{ArcSin}(cx))}{2d^2\left(d+ex^2\right)}+\frac{bce\text{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}}+\frac{e(a+b\text{ArcSin}(c\ldots}{}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/d^2/x^2-1/2*e*(a+b*arcsin(c*x))/d^2/(e*x^2+d)-2*e*(a
+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+e*(a+b*arcsin(c*x))*
ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d
^3+e*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)-(c^2*d+e)^(1/2)))/d^3+e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3+e*(a+b*arcsin(c*x))*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3+I*b
*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-I*b*e*polylog(2,-(I*c*x+(-c^
2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3-I*b*e*polylog
(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3
-I*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))/d^3-I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d
)^(1/2)+(c^2*d+e)^(1/2)))/d^3+1/2*b*c*e*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-
c^2*x^2+1)^(1/2))/d^(5/2)/(c^2*d+e)^(1/2)-1/2*b*c*(-c^2*x^2+1)^(1/2)/d^2/x
```

Rubi [A]
time = 0.74, antiderivative size = 632, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.619$, Rules used = {4817, 4723, 270, 4721, 3798, 2221, 2317, 2438, 4813, 385, 211, 4825, 4617}

$$\frac{e(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}+\frac{e(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}+\frac{e(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}+\frac{e(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3}-\frac{2e\log\left(1-e^{2i\text{ArcSin}(cx)}\right)(a+b\text{ArcSin}(cx))}{d^3}-\frac{e(a+b\text{ArcSin}(cx))}{2d^2\left(d+ex^2\right)}-\frac{a+b\text{ArcSin}(cx)}{2d^2x^2}-\frac{ibe\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{d^3}-\frac{ibe\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{d^3}-\frac{ibe\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{d^3}-\frac{ibe\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{d^3}+\frac{ibe\text{Li}_2\left(e^{2i\text{ArcSin}(cx)}\right)}{d^3}+\frac{bce\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}}-\frac{bc\sqrt{1-c^2x^2}}{2d^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d^2*x) - (a + b*ArcSin[c*x])/(2*d^2*x^2) - (e
*(a + b*ArcSin[c*x]))/(2*d^2*(d + e*x^2)) + (b*c*e*ArcTan[(Sqrt[c^2*d + e]*
x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqrt[c^2*d + e]) + (e*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (e*(a + b*Ar
cSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
 e])])/d^3 - (2*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 -
 (I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
 + e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
```

```
 - Sqrt[c^2*d + e])])/d^3 - (I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (I*b*e*PolyLog[2, E^
((2*I)*ArcSin[c*x])])/d^3
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)^2}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{d^2x^3} - \frac{2e(a+b\sin^{-1}(cx))}{d^3x} + \frac{e^2x(a+b\sin^{-1}(cx))}{d^2\left(d+ex^2\right)^2} + \frac{2e^2x(a+b\sin^{-}}{d^3\left(d+ex^2\right.}\right.$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^3}\,dx}{d^2} - \frac{(2e)\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^3} + \frac{(2e^2)\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{d^3} + \frac{e^2\int \frac{x(a+b\sin^{-1}(}{(d+ex^2)^{}}}{d^2}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e(a+b\sin^{-1}(cx))}{2d^2\left(d+ex^2\right)} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d^2} - \frac{(2e)\text{Subst}\left(\int (a+\right.}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e(a+b\sin^{-1}(cx))}{2d^2\left(d+ex^2\right)} + \frac{ie(a+b\sin^{-1}(cx))^2}{bd^3} + \frac{(4i}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e(a+b\sin^{-1}(cx))}{2d^2\left(d+ex^2\right)} + \frac{ie(a+b\sin^{-1}(cx))^2}{bd^3} + \frac{bce}{}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e(a+b\sin^{-1}(cx))}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right.}{2d^{5/2}\sqrt{c^2d+e}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e(a+b\sin^{-1}(cx))}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right.}{2d^{5/2}\sqrt{c^2d+e}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e(a+b\sin^{-1}(cx))}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right.}{2d^{5/2}\sqrt{c^2d+e}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\sin^{-1}(cx)}{2d^2x^2} - \frac{e(a+b\sin^{-1}(cx))}{2d^2\left(d+ex^2\right)} + \frac{bce\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right.}{2d^{5/2}\sqrt{c^2d+e}}$$

Mathematica [F]
time = 3.85, size = 0, normalized size = 0.00

$$\int \frac{a+b\text{ArcSin}(cx)}{x^3\left(d+ex^2\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2),x]
[Out] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2), x]
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.54, size = 694, normalized size = 1.10

method	result
derivativedivides	$c^2\left(-\frac{ae}{2d^2(c^2e\,x^2+c^2d)}+\frac{ae\ln(c^2e\,x^2+c^2d)}{c^2d^3}-\frac{a}{2d^2c^2x^2}-\frac{2ae\ln(cx)}{c^2d^3}+\frac{2ibe\,\mathrm{dilog}\left(1+icx+\sqrt{-c^2x^2+1}\right)}{c^2d^3}\right.$
default	$c^2\left(-\frac{ae}{2d^2(c^2e\,x^2+c^2d)}+\frac{ae\ln(c^2e\,x^2+c^2d)}{c^2d^3}-\frac{a}{2d^2c^2x^2}-\frac{2ae\ln(cx)}{c^2d^3}+\frac{2ibe\,\mathrm{dilog}\left(1+icx+\sqrt{-c^2x^2+1}\right)}{c^2d^3}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-1/2*a*e/d^2/(c^2*e*x^2+c^2*d)+a/c^2*e/d^3*ln(c^2*e*x^2+c^2*d)-1/2*a/d
^2/c^2/x^2-2*a/c^2/d^3*e*ln(c*x)+2*I*b/c^2/d^3*e*dilog(1+I*c*x+(-c^2*x^2+1)
^(1/2))+1/2*I*b/c^2/d^3*e^2*sum((_R1^2-1)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*
x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/
2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/2*b*c/x/(c^2*e*x^2+c^
2*d)/d*(-c^2*x^2+1)^(1/2)-1/2*b*c*x/(c^2*e*x^2+c^2*d)/d^2*(-c^2*x^2+1)^(1/2
)*e-1/2*b/x^2/(c^2*e*x^2+c^2*d)/d*arcsin(c*x)-b*arcsin(c*x)*e/d^2/(c^2*e*x^
2+c^2*d)-2*I*b/c^2/d^3*e*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+1/2*I*b/c^2*(d*c^2
*(c^2*d+e))^(1/2)/d^3/(c^2*d+e)*arctanh(1/4*(4*c^2*d-2*e*(I*c*x+(-c^2*x^2+1
)^(1/2))^2+2*e)/(c^4*d^2+c^2*d*e)^(1/2))*e+1/2*I*b*c^2/(c^2*e*x^2+c^2*d)/d-
2*b/c^2/d^3*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/2*I*b*c^2*x^2/(c
^2*e*x^2+c^2*d)/d^2*e-1/2*I*b/c^2/d^3*e*sum((-_R1^2*e+4*c^2*d+e)/(-_R1^2*e+
2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1
-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((2*x^2*e + d)/(d^2*x^4*e + d^3*x^2) - 2*e*log(x^2*e + d)/d^3 + 4*e*
log(x)/d^3) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^7*e
^2 + 2*d*x^5*e + d^2*x^3), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(x^7*e^2 + 2*d*x^5*e + d^2*x^3), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{x^{3} \left(d + ex^{2}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d)**2,x)
[Out] Integral((a + b*asin(c*x))/(x**3*(d + e*x**2)**2), x)
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{x^3\,{\left(e\,x^2+d\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^2), x)
```

3.637 $\int \frac{x^4(a+b\textbf{ArcSin}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=787

$$\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\text{ArcSin}(cx)}{e^2}-\frac{d(a+b\text{ArcSin}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\text{ArcSin}(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)}+\frac{bcd\tanh^{-1}\left(\frac{\sqrt{e}-}{\sqrt{c^2d+}}\right.}{4e^{5/2}\sqrt{c^2d}}$$

```
[Out] a*x/e^2+b*x*arcsin(c*x)/e^2+3/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^
(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/4*(a+
b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)+3/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^
2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/
4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)
+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)+3/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1
)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/4*I
*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(
1/2)))*(-d)^(1/2)/e^(5/2)+3/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(
1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/4*I*b*polylog(2
,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^
(1/2)/e^(5/2)-1/4*d*(a+b*arcsin(c*x))/e^(5/2)/((-d)^(1/2)-x*e^(1/2))+1/4*d*
(a+b*arcsin(c*x))/e^(5/2)/((-d)^(1/2)+x*e^(1/2))+1/4*b*c*d*arctanh((-c^2*x*
(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(5/2)/(c^2*d+e)^(
1/2)+1/4*b*c*d*arctanh((c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2
+1)^(1/2))/e^(5/2)/(c^2*d+e)^(1/2)+b*(-c^2*x^2+1)^(1/2)/c/e^2
```

Rubi [A]
time = 1.47, antiderivative size = 787, normalized size of antiderivative = 1.00, number of steps used = 49, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {4817, 4715, 267, 4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\frac{3\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}-\frac{3\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}+\frac{3\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}-\frac{3\sqrt{-d}\,(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}}-\frac{d(a+b\text{ArcSin}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\text{ArcSin}(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)}+\frac{ax}{e^2}+\frac{3ib\sqrt{-d}\,\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{-d}\,\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4e^{5/2}}+\frac{3ib\sqrt{-d}\,\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{-d}\,\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{4e^{5/2}}+\frac{bx\text{ArcSin}(cx)}{e^2}+\frac{bcd\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}\,x}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{5/2}\sqrt{c^2d+e}}+\frac{bcd\tanh^{-1}\left(\frac{c^2\sqrt{-d}\,x+\sqrt{e}}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{5/2}\sqrt{c^2d+e}}+\frac{b\sqrt{1-c^2x^2}}{ce^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a*x)/e^2 + (b*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*x*ArcSin[c*x])/e^2 - (d*(a +
 b*ArcSin[c*x]))/(4*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (d*(a + b*ArcSin[c*x]
))/(4*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*d*ArcTanh[(Sqrt[e] - c^2*Sqrt[
-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(5/2)*Sqrt[c^2*d + e]) +
(b*c*d*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2
])])/(4*e^(5/2)*Sqrt[c^2*d + e]) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2))
```

```
- (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2)) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])
*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*
e^(5/2)) - (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*e^(5/2)) + (((3*I)/4)*b*Sqrt[-d]*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/e^(5/2) - (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(5/2) + (((3*I)/4)*b*Sqrt[-d]*PolyLog[2,
 -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2)
- (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/e^(5/2)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{e^2}+\frac{d^2(a+b\sin^{-1}(cx))}{e^2\,(d+ex^2)^2}-\frac{2d(a+b\sin^{-1}(cx))}{e^2\,(d+ex^2)}\right)\,dx$$

$$=\frac{\int (a+b\sin^{-1}(cx))\,dx}{e^2}-\frac{(2d)\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{e^2}+\frac{d^2\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^2}\,dx}{e^2}$$

$$=\frac{ax}{e^2}+\frac{b\int \sin^{-1}(cx)\,dx}{e^2}-\frac{(2d)\int \left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)\,dx}{e^2}$$

$$=\frac{ax}{e^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{e^2}-\frac{\sqrt{-d}\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{e^2}-\frac{\sqrt{-d}}{}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{d(a+b\sin^{-1}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\sin^{-1}}{4e^{5/2}\left(\sqrt{-d}+\right.}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{d(a+b\sin^{-1}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\sin^{-1}}{4e^{5/2}\left(\sqrt{-d}+\right.}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{d(a+b\sin^{-1}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\sin^{-1}}{4e^{5/2}\left(\sqrt{-d}+\right.}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{d(a+b\sin^{-1}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\sin^{-1}}{4e^{5/2}\left(\sqrt{-d}+\right.}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{d(a+b\sin^{-1}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\sin^{-1}}{4e^{5/2}\left(\sqrt{-d}+\right.}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{d(a+b\sin^{-1}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\sin^{-1}}{4e^{5/2}\left(\sqrt{-d}+\right.}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\sin^{-1}(cx)}{e^2}-\frac{d(a+b\sin^{-1}(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{d(a+b\sin^{-1}}{4e^{5/2}\left(\sqrt{-d}+\right.}$$

Mathematica [A]
time = 1.00, size = 649, normalized size = 0.82

$$\frac{8a\sqrt{e}\,x+\frac{4ad\sqrt{e}\,x}{d+ex^2}-12a\sqrt{d}\,\text{ArcTan}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)+b\left(\frac{8\sqrt{e}\left(\sqrt{1-c^2x^2}+cx\text{ArcSin}(cx)\right)}{c}+2id\left(\frac{\text{ArcSin}(cx)}{\sqrt{d}+i\sqrt{e}\,x}-\frac{c\text{ArcTan}\left(\frac{i\sqrt{e}+c^2\sqrt{d}\,x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)+2d\left(\frac{\text{ArcSin}(cx)}{i\sqrt{d}+\sqrt{e}\,x}+\frac{c\tanh^{-1}\left(\frac{\sqrt{e}+ic^2\sqrt{d}\,x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)+3\sqrt{d}\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)-3\sqrt{d}\left(\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)}{8e^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (8*a*Sqrt[e]*x + (4*a*d*Sqrt[e]*x)/(d + e*x^2) - 12*a*Sqrt[d]*ArcTan[(Sqrt[
e]*x)/Sqrt[d]] + b*((8*Sqrt[e]*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]))/c + (
2*I)*d*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sq
rt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + 2*d*(ArcS
in[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(S
qrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + 3*Sqrt[d]*(ArcSin[c*
x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - S
qrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^
2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqr
t[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sq
rt[c^2*d + e]))]) - 3*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (S
qrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt
[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(8*e^(5/2))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 8.15, size = 1765, normalized size = 2.24

method	result	size
derivativedivides	Expression too large to display	1765
default	Expression too large to display	1765

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(a*c^5/e^2*x+1/2*a*c^7/e^2*d*x/(c^2*e*x^2+c^2*d)-3/2*a*c^5/e^2*d/(d*e
)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/2*b*c^7*arcsin(c*x)*d*x/e^2/(c^2*e*x^2+c^
2*d)+b*c^8*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x
+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d^2/e
^5+1/2*b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c
*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d/e
^4+b*c^8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(
-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d^2/e^
5+1/2*b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*
x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d/e
^4+b*c^4/e^2*(-c^2*x^2+1)^(1/2)+b*c^5/e^2*arcsin(c*x)*x-b*c^10*((2*c^2*d+2*
```

```
(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^3*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^5/(c^2*d+e)-b*c^8*((2*
c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^2*arctanh(e*(I*c*x+(-c^2*x^2+
1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)-b*
c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*
x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d/e^5*(d*c^2
*(c^2*d+e))^(1/2)-b*c^10*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*d
^3*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)
-e)*e)^(1/2))/e^5/(c^2*d+e)-b*c^8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)
)^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+
e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)+b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))
^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c
^2*d+e))^(1/2)-e)*e)^(1/2))*d/e^5*(d*c^2*(c^2*d+e))^(1/2)+b*c^8*((2*c^2*d+2
*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^2*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2
))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^5/(c^2*d+e)*(d*c^2*(c
^2*d+e))^(1/2)+1/2*b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d*
arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)
*e)^(1/2))/e^4/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-b*c^8*(-e*(2*c^2*d-2*(d*c^
2*(c^2*d+e))^(1/2)+e))^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c
^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^5/(c^2*d+e)*(d*c^2*(c^2*d+e))
^(1/2)-1/2*b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*d*arctan(
e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/
2))/e^4/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)+3/4*b*c^6*d/e^2*sum(1/_R1/(-_R1^2
*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((
_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e
))+3/4*b*c^6*d/e^2*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*
x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=R
ootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*(3*sqrt(d)*arctan(x*e^(1/2)/sqrt(d))*e^(-5/2) - 2*x*e^(-2) - d*x/(x^2*
e^3 + d*e^2))*a + b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)/(x^4*e^2 + 2*d*x^2*e + d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(x^4*e^2 + 2*d*x^2*e + d^2), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a+b\,\mathrm{asin}\,(cx))}{\left(d+ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d)**2,x)
[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^4/(e*x^2 + d)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
[Out] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.638 $\int \frac{x^2(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=745

$$\frac{a+b\text{ArcSin}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{a+b\text{ArcSin}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}\,x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}}{\sqrt{c^2d+}}\right.}{4e^{3/2}\sqrt{c^2}}$$

```
[Out] 1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(
1/2)+1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d
)^(1/2)+(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*(a+b*arcsin(c*x))*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(3/2)/(
-d)^(1/2)+1/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*I*b*polylog(2,(I*c*x+(-c^2*x^
2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)+1/
4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+
e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)+1/4*(a+b*arcsi
n(c*x))/e^(3/2)/((-d)^(1/2)-x*e^(1/2))+1/4*(-a-b*arcsin(c*x))/e^(3/2)/((-d)
^(1/2)+x*e^(1/2))-1/4*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/
2)/(-c^2*x^2+1)^(1/2))/e^(3/2)/(c^2*d+e)^(1/2)-1/4*b*c*arctanh((c^2*x*(-d)^
(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(3/2)/(c^2*d+e)^(1/2)
```

Rubi [A]
time = 1.39, antiderivative size = 745, normalized size of antiderivative = 1.00, number of steps used = 46, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {4817, 4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}\,e^{3/2}}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}\,e^{3/2}}+\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}\,e^{3/2}}-\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}\,e^{3/2}}+\frac{a+b\text{ArcSin}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{a+b\text{ArcSin}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4\sqrt{-d}\,e^{3/2}}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4\sqrt{-d}\,e^{3/2}}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{4\sqrt{-d}\,e^{3/2}}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{4\sqrt{-d}\,e^{3/2}}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}\,x}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{3/2}\sqrt{c^2d+e}}-\frac{bc\tanh^{-1}\left(\frac{c^2\sqrt{-d}\,x+\sqrt{e}}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{3/2}\sqrt{c^2d+e}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a + b*ArcSin[c*x])/(4*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) - (a + b*ArcSin[c*x]
)/(4*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(3/2)*Sqrt[c^2*d + e]) - (b*
c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/
(4*e^(3/2)*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) - ((a +
 b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^
2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
```

```
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) -
((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sq
rt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I
/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e
])])/(Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I/4)*b*PolyLog[
2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]
*e^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
```

```
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx = \int \left(-\frac{d(a+b\sin^{-1}(cx))}{e\,(d+ex^2)^2} + \frac{a+b\sin^{-1}(cx)}{e\,(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{e} - \frac{d\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^2}\,dx}{e}$$

$$= \frac{\int \left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx}{e} - \frac{d\int \left(-\frac{e(a+b\sin^{-1}(cx))}{4d\left(\sqrt{-d}\,\sqrt{e}-ex\right)^2} -\right.}{}$$

$$= \frac{1}{4}\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\,\sqrt{e}-ex\right)^2}\,dx + \frac{1}{4}\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\,\sqrt{e}+ex\right)^2}\,dx + \frac{1}{2}\int \frac{a+b\sin^{-1}(cx}{-de-e^2x^2}$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{1}{2}\int \left(-\frac{\sqrt{-d}\,(a+b\sin^{-1}(}{2de\left(\sqrt{-d}-\sqrt{e}\right.}\right.$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{(bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x\right.}{4e}$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}}{\sqrt{c^2d+e}\,\sqrt{1-}}\right.}{4e^{3/2}\sqrt{c^2d+e}}$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}}{\sqrt{c^2d+e}\,\sqrt{1-}}\right.}{4e^{3/2}\sqrt{c^2d+e}}$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}}{\sqrt{c^2d+e}\,\sqrt{1-}}\right.}{4e^{3/2}\sqrt{c^2d+e}}$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}}{\sqrt{c^2d+e}\,\sqrt{1-}}\right.}{4e^{3/2}\sqrt{c^2d+e}}$$

$$= \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{a+b\sin^{-1}(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}}{\sqrt{c^2d+e}\,\sqrt{1-}}\right.}{4e^{3/2}\sqrt{c^2d+e}}$$

Mathematica [A]
time = 0.77, size = 603, normalized size = 0.81

$$\frac{-\frac{4a\sqrt{e}x}{d+ex^2}+\frac{4a\text{ArcTan}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}}+b\left(-\frac{2\text{ArcSin}(cx)}{i\sqrt{d}+\sqrt{e}x}-2i\left(\frac{\text{ArcSin}(cx)}{\sqrt{d}+i\sqrt{e}x}-\frac{c\text{ArcTan}\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)-\frac{2c\tanh^{-1}\left(\frac{\sqrt{e}+ic^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}-\frac{\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)}{\sqrt{d}}+\frac{\text{ArcSin}(cx)\left(\text{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+2\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)}{\sqrt{d}}\right)}{8e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] ((-4*a*Sqrt[e]*x)/(d + e*x^2) + (4*a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[d] +
 b*((-2*ArcSin[c*x])/(I*Sqrt[d] + Sqrt[e]*x) - (2*I)*(ArcSin[c*x]/(Sqrt[d]
+ I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (2*c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*
x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] - (ArcSin[c*x]*(Ar
cSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^
2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d +
e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*
d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2
*d + e]))])/Sqrt[d] + (ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(
I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])/Sqrt[d]))/(8*e^(3/2))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 1.74, size = 1698, normalized size = 2.28

method	result	size
derivativedivides	Expression too large to display	1698
default	Expression too large to display	1698

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-1/2*a*c^5/e*x/(c^2*e*x^2+c^2*d)+1/2*a*c^3/e/(d*e)^(1/2)*arctan(e*x/
(d*e)^(1/2))-1/2*b*c^5*arcsin(c*x)*x/e/(c^2*e*x^2+c^2*d)-1/4*b*c^4/e*sum(1/
_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_
R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-
2*e)*_Z^2+e))-1/4*b*c^4/e*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_
R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)
),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+b*c^8*((2*c^2*d+2*(d*c^2*(c^2*d
+e))^(1/2)+e)*e)^(1/2)*d^2*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2
*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)-b*c^6*((2*c^2*d+2*(d*c^
2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c
^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)*(d*c^2*(c^2*d+e))
```

```
^(1/2)+b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c
*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3
/(c^2*d+e)*d-1/2*b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arct
anh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^
(1/2))/e^3/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-b*c^6*((2*c^2*d+2*(d*c^2*(c^2*
d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d
*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d/e^4+b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e)
)^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2
*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4*(d*c^2*(c^2*d+e))^(1/2)-1/2*b*c^4*((2*c^
2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3+b*c^8*(-e*(2*c^2*d
-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)+b*c^6*(-e
*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*d*arctan(e*(I*c*x+(-c^2*x^2+1
)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)*(d
*c^2*(c^2*d+e))^(1/2)+b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2
)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-
e)*e)^(1/2))/e^3/(c^2*d+e)*d+1/2*b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/
2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d
+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-b*c^6*(-e*(2*
c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2
))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d/e^4-b*c^4*(-e*(2*c^2
*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/
((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4*(d*c^2*(c^2*d+e))^(1/
2)-1/2*b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c
*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^
3)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(arctan(x*e^(1/2)/sqrt(d))*e^(-3/2)/sqrt(d) - x/(x^2*e^2 + d*e))*a + b*
integrate(x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^4*e^2 + 2*d*x^2
*e + d^2), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(x^4*e^2 + 2*d*x^2*e + d^2), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a + b\operatorname{asin}(cx))}{(d + ex^2)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(e*x^2 + d)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,(a + b\operatorname{asin}(c\,x))}{(e\,x^2 + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.639 $\int \frac{a+b\textbf{ArcSin}(cx)}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=757

$$-\frac{a+b\text{ArcSin}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{a+b\text{ArcSin}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}\,x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\tanh^{-1}\left(\frac{\cdots}{\sqrt{c^2\cdots}}\right)}{4d\sqrt{e}\cdots}$$

```
[Out] -1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^
(1/2)-1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-
d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*(a+b*arcsin(c*x))*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/
2)/e^(1/2)-1/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^
(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*I*b*polylog(2,(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)-1
/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*(-a-b*arc
sin(c*x))/d/e^(1/2)/((-d)^(1/2)-x*e^(1/2))+1/4*(a+b*arcsin(c*x))/d/e^(1/2)/
((-d)^(1/2)+x*e^(1/2))+1/4*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e
)^(1/2)/(-c^2*x^2+1)^(1/2))/d/e^(1/2)/(c^2*d+e)^(1/2)+1/4*b*c*arctanh((c^2*
x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d/e^(1/2)/(c^2*d+
e)^(1/2)
```

Rubi [A]
time = 0.70, antiderivative size = 757, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 9, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{a+b\text{ArcSin}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{a+b\text{ArcSin}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-d}\,x}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\tanh^{-1}\left(\frac{c^2\sqrt{-d}\,x+\sqrt{e}}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^2,x]
```

```
[Out] -1/4*(a + b*ArcSin[c*x])/(d*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin
[c*x])/(4*d*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*ArcTanh[(Sqrt[e] - c^2*S
qrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d +
e]) + (b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2
*x^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqr
t[e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[
```

-d] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^(3/2)*Sqrt[e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*Sqrt[e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/((-d)^(3/2)*Sqrt[e])

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
```

```
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^2}\,dx = \int \left(-\frac{e(a+b\sin^{-1}(cx))}{4d\left(\sqrt{-d}\,\sqrt{e}-ex\right)^2}-\frac{e(a+b\sin^{-1}(cx))}{4d\left(\sqrt{-d}\,\sqrt{e}+ex\right)^2}-\frac{e(a+b\sin^{-1}(cx))}{2d\left(-de-e^2x^2\right)}\right)dx$$

$$= -\frac{e\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\,\sqrt{e}-ex\right)^2}\,dx}{4d} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\,\sqrt{e}+ex\right)^2}\,dx}{4d} - \frac{e\int \frac{a+b\sin^{-1}(cx)}{-de-e^2x^2}\,dx}{2d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{(bc)\int \frac{1}{\left(\sqrt{-d}\,\sqrt{e}-ex\right)\sqrt{1}}}{4d}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{4(-d)^{3/2}} + \frac{\int \frac{a}{\sqrt{}}}{}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-}}{\sqrt{c^2d+e}\,\sqrt{1}}\right.}{4d\sqrt{e}\,\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-}}{\sqrt{c^2d+e}\,\sqrt{1}}\right.}{4d\sqrt{e}\,\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-}}{\sqrt{c^2d+e}\,\sqrt{1}}\right.}{4d\sqrt{e}\,\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-}}{\sqrt{c^2d+e}\,\sqrt{1}}\right.}{4d\sqrt{e}\,\sqrt{c^2d+e}}$$

$$= -\frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\sin^{-1}(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\tanh^{-1}\left(\frac{\sqrt{e}-c^2\sqrt{-}}{\sqrt{c^2d+e}\,\sqrt{1}}\right.}{4d\sqrt{e}\,\sqrt{c^2d+e}}$$

Mathematica [A]

time = 1.14, size = 591, normalized size = 0.78

$$\frac{1}{2}\left(\frac{ax}{d^2+dex^2}+\frac{a\text{ArcTan}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{d^{3/2}\sqrt{e}}+\frac{b\left(i\sqrt{d}\left(\frac{\text{ArcSin}(cx)}{\sqrt{d}+i\sqrt{e}\,x}-\frac{c\text{ArcTan}\left(\frac{i\sqrt{e}+c^2\sqrt{d}\,x}{\sqrt{c^2d+e}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)+\sqrt{d}\left(\frac{\text{ArcSin}(cx)}{i\sqrt{d}+\sqrt{e}\,x}+\frac{c\tanh^{-1}\left(\frac{\sqrt{e}+ic^2\sqrt{d}\,x}{\sqrt{c^2d+e}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)+i\text{ArcSin}(cx)\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)-i\text{ArcSin}(cx)\left(\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)+\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)-\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)-\text{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)+\text{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)}{2d^{3/2}\sqrt{e}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^2,x]
```

```
[Out] ((a*x)/(d^2 + d*e*x^2) + (a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(d^(3/2)*Sqrt[e])
+ (b*(I*Sqrt[d]*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e]
 + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) +
Sqrt[d]*(ArcSin[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*ArcTanh[(Sqrt[e] + I*c^2*
Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + I*ArcSi
n[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e]
)] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]) -
I*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d
+ e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]
) + PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] -
 PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] -
 PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))] +
 PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(2
*d^(3/2)*Sqrt[e]))/2
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 3.22, size = 1706, normalized size = 2.25

method	result	size
derivativedivides	Expression too large to display	1706
default	Expression too large to display	1706

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(1/2*a*c^3*x/d/(c^2*e*x^2+c^2*d)+1/2*a*c/d/(d*e)^(1/2)*arctan(e*x/(d*e)
^(1/2))+1/2*b*c^3*arcsin(c*x)*x/d/(c^2*e*x^2+c^2*d)-b*c^6*((2*c^2*d+2*(d*c^
2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2
*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)*d+b*c^4*((2*c^2*d+2
*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/(
(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)*(d*c^2*(c^2*d
+e))^(1/2)-b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*
(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))
/(c^2*d+e)/e^2+1/2*b*c^2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*ar
ctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e
)^(1/2))/d/(c^2*d+e)/e^2*(d*c^2*(c^2*d+e))^(1/2)+b*c^4*((2*c^2*d+2*(d*c^2*(
c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+
2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3-b*c^2*((2*c^2*d+2*(d*c^2*(c^2*d+
e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c
^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/e^3*(d*c^2*(c^2*d+e))^(1/2)+1/2*b*c^2*((
2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)
```

```
^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/e^2-b*c^6*(-e*(2
*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)*d-b*c^4
*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2
+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)*
(d*c^2*(c^2*d+e))^(1/2)-b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1
/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2
)-e)*e)^(1/2))/(c^2*d+e)/e^2-1/2*b*c^2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/
2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d
+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e^2*(d*c^2*(c^2*d+e))^(1/2)+b*c^4*(-e*(
2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1
/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3+b*c^2*(-e*(2*c^2
*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/
((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d/e^3*(d*c^2*(c^2*d+e))^(
1/2)+1/2*b*c^2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I
*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/
d/e^2-1/4*b*c^2/d*sum(1/_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c
*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=
RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/4*b*c^2/d*sum(_R1/(-_R1^2*e+2*c^2*d
+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-
(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] 1/2*a*(arctan(x*e^(1/2)/sqrt(d))*e^(-1/2)/d^(3/2) + x/(d*x^2*e + d^2)) + b*
integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x^4*e^2 + 2*d*x^2*e +
 d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(x^4*e^2 + 2*d*x^2*e + d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{(d + ex^2)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2)^2, x)
```

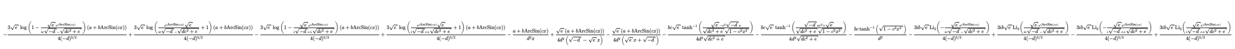
3.640 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x^2(d+ex^2)^2}\,dx$

Optimal. Leaf size=795

$$-\frac{a+b\text{ArcSin}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\text{ArcSin}(cx))}{4d^2\left(\sqrt{-d}\,-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\text{ArcSin}(cx))}{4d^2\left(\sqrt{-d}\,+\sqrt{e}\,x\right)}-\frac{bc\sqrt{e}\,\tanh^{-1}\left(\frac{\sqrt{e}\,-c^2\sqrt{-d}\,x}{\sqrt{c^2d+e}\,\sqrt{1-c^2x^2}}\right.}{4d^2\sqrt{c^2d+e}}$$

[Out] (-a-b*arcsin(c*x))/d^2/x-b*c*arctanh((-c^2*x^2+1)^(1/2))/d^2-3/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)+3/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)-3/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)+3/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)-3/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)+3/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)-3/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)+3/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)+1/4*(a+b*arcsin(c*x))*e^(1/2)/d^2/((-d)^(1/2)-x*e^(1/2))-1/4*(a+b*arcsin(c*x))*e^(1/2)/d^2/((-d)^(1/2)+x*e^(1/2))-1/4*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))*e^(1/2)/d^2/(c^2*d+e)^(1/2)-1/4*b*c*arctanh((c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))*e^(1/2)/d^2/(c^2*d+e)^(1/2)

Rubi [A]
time = 1.44, antiderivative size = 795, normalized size of antiderivative = 1.00, number of steps used = 50, number of rules used = 14, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {4817, 4723, 272, 65, 214, 4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}



Antiderivative was successfully verified.

[In] Int[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)^2),x]

[Out] -((a + b*ArcSin[c*x])/(d^2*x)) + (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt[-d] - Sqrt[e]*x)) - (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt[-d] + Sqrt[e]*x)) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d + e]) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d + e]) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 - (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(

```
4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - (3*Sqrt[e]*(a +
 b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^
2*d + e])])/(4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - ((
(3*I)/4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) - (((3*I)/
4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(5/2)
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^2\left(d+ex^2\right)^2}\,dx=\int\left(\frac{a+b\sin^{-1}(cx)}{d^2x^2}-\frac{e(a+b\sin^{-1}(cx))}{d\left(d+ex^2\right)^2}-\frac{e(a+b\sin^{-1}(cx))}{d^2\left(d+ex^2\right)}\right)\,dx$$

$$=\frac{\int\frac{a+b\sin^{-1}(cx)}{x^2}\,dx}{d^2}-\frac{e\int\frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{d^2}-\frac{e\int\frac{a+b\sin^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{(bc)\int\frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d^2}-\frac{e\int\left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\right.}\right.}{d^2}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{(bc)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d^2}+\frac{e\int\frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2(-d)^{5/2}}+ \cdots$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{b\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\cdots}\right.}{\cdots}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{bc\tanh^{-1}\left(\sqrt{\cdots}\right.}{d^2}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{bc\sqrt{e}\,\tanh^{-1}\cdots}{4\cdots}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{bc\sqrt{e}\,\tanh^{-1}\cdots}{4\cdots}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{bc\sqrt{e}\,\tanh^{-1}\cdots}{4\cdots}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{bc\sqrt{e}\,\tanh^{-1}\cdots}{4\cdots}$$

$$=-\frac{a+b\sin^{-1}(cx)}{d^2x}+\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\,(a+b\sin^{-1}(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{bc\sqrt{e}\,\tanh^{-1}\cdots}{4\cdots}$$

Mathematica [A]
time = 0.98, size = 672, normalized size = 0.85

$$\frac{-\frac{8a\sqrt{d}}{x} - \frac{4a\sqrt{d}\,ex}{d+ex^2} - 12a\sqrt{e}\,\mathrm{ArcTan}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right) + b\left(-2i\sqrt{d}\,\sqrt{e}\left(\frac{\mathrm{ArcSin}(cx)}{\sqrt{d}+i\sqrt{e}\,x} - \frac{c\,\mathrm{ArcTan}\left(\frac{i\sqrt{e}+c^2\sqrt{d}\,x}{\sqrt{c^2d+e}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right) + 2\sqrt{d}\,\sqrt{e}\left(-\frac{\mathrm{ArcSin}(cx)}{i\sqrt{d}+\sqrt{e}\,x} - \frac{c\tanh^{-1}\left(\frac{\sqrt{e}+ic^2\sqrt{d}\,x}{\sqrt{c^2d+e}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right) - \frac{8\sqrt{d}\left(\mathrm{ArcSin}(cx)+cx\tanh^{-1}\left(\sqrt{1-c^2x^2}\right)\right)}{x} + 3\sqrt{e}\left(\mathrm{ArcSin}(cx)\left(\mathrm{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+2\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right) - 3\sqrt{e}\left(\mathrm{ArcSin}(cx)\left(\mathrm{ArcSin}(cx)+2i\left(\log\left(1+\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}\,e^{i\mathrm{ArcSin}(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)}{8d^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] ((-8*a*Sqrt[d])/x - (4*a*Sqrt[d]*e*x)/(d + e*x^2) - 12*a*Sqrt[e]*ArcTan[(Sq
rt[e]*x)/Sqrt[d]] + b*((-2*I)*Sqrt[d]*Sqrt[e]*(ArcSin[c*x]/(Sqrt[d] + I*Sqr
t[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c
^2*x^2])])/Sqrt[c^2*d + e]) + 2*Sqrt[d]*Sqrt[e]*(-(ArcSin[c*x]/(I*Sqrt[d] +
 Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt
[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (8*Sqrt[d]*(ArcSin[c*x] + c*x*ArcTanh[S
qrt[1 - c^2*x^2]]))/x + 3*Sqrt[e]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1
+ (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqr
t[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sq
rt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -
((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) - 3*Sqrt[e]*(
ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*
Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])))/(8*d^(5/2))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 6.03, size = 1839, normalized size = 2.31

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x)
```

```
[Out] -1/2*a/d^2*e*c^2*x/(c^2*e*x^2+c^2*d)-3/2*a/d^2*e/(d*e)^(1/2)*arctan(e*x/(d*
e)^(1/2))-a/d^2/x-3/2*b*c^2*x*arcsin(c*x)/d^2/(c^2*e*x^2+c^2*d)*e-b*c^2/x*a
rcsin(c*x)/d/(c^2*e*x^2+c^2*d)+b*c^5*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)
*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e)
)^(1/2)+e)*e)^(1/2))/(c^2*d+e)/e^2-b*c^3*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2
)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*
d+e))^(1/2)+e)*e)^(1/2))/d/(c^2*d+e)/e^2*(d*c^2*(c^2*d+e))^(1/2)+b*c^3*((2*
c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(
1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/(c^2*d+e)/e-1/2*c*
b*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^
2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d^2/(c^2*d+e)/
e*(d*c^2*(c^2*d+e))^(1/2)-b*c^3*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(
```

```
1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/
2)+e)*e)^(1/2))/e^2/d+c*b*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*a
rctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*
e)^(1/2))/e^2/d^2*(d*c^2*(c^2*d+e))^(1/2)-1/2*c*b*((2*c^2*d+2*(d*c^2*(c^2*d
+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*
c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e/d^2+b*c^5*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+
e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2
*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)/e^2+b*c^3*(-e*(2*c^2*d-2*(d*c^2*(c
^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(
d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e^2*(d*c^2*(c^2*d+e))^(1/2)
+b*c^3*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c
^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d
+e)/e+1/2*c*b*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*
c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d
^2/(c^2*d+e)/e*(d*c^2*(c^2*d+e))^(1/2)-b*c^3*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e
))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*
(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^2/d-c*b*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1
/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*
d+e))^(1/2)-e)*e)^(1/2))/e^2/d^2*(d*c^2*(c^2*d+e))^(1/2)-1/2*c*b*(-e*(2*c^2
*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/
((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e/d^2+3/16*b/c/d^3*e*sum(
(_R1^2*e-4*c^2*d-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+c*b/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-c*b
/d^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/16*b/c/d^3*e*sum((4*_R1^2*c^2*d+_R1^2
*e-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/
2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c
^2*d-2*e)*_Z^2+e))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="maxima")
[Out] -1/2*a*((3*x^2*e + 2*d)/(d^2*x^3*e + d^3*x) + 3*arctan(x*e^(1/2)/sqrt(d))*e
^(1/2)/d^(5/2)) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(x
^6*e^2 + 2*d*x^4*e + d^2*x^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^6*e^2 + 2*d*x^4*e + d^2*x^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{x^2 (d + ex^2)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**2/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*(d + e*x**2)**2), x)
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{asin}(c\,x)}{x^2 \left(e\,x^2 + d\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^2*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*asin(c*x))/(x^2*(d + e*x^2)^2), x)
```

3.641 $\int \frac{x^5(a+b\mathbf{ArcSin}(cx))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=705

$$\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{d^2(a+b\text{ArcSin}(cx))}{4e^3\left(d+ex^2\right)^2}+\frac{d(a+b\text{ArcSin}(cx))}{e^3\left(d+ex^2\right)}-\frac{i(a+b\text{ArcSin}(cx))^2}{2be^3}-\frac{bc\sqrt{d}\,\text{ArcTan}\Big(}{e^3\sqrt{c}}$$

```
[Out] -1/4*d^2*(a+b*arcsin(c*x))/e^3/(e*x^2+d)^2+d*(a+b*arcsin(c*x))/e^3/(e*x^2+d
)-1/2*I*(a+b*arcsin(c*x))^2/b/e^3+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^3+1/2*(a+b*arcsin(
c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/
2)))/e^3+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c
*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3+1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3-1/2*I*b*polylog(
2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^3
-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*
d+e)^(1/2)))/e^3-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c
*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/
2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3+1/8*b*c*(2*c^2*d+e)*arcta
n(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))*d^(1/2)/e^3/(c^2*d+e)^(3/2)
-b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))*d^(1/2)/e^3/(c^2*
d+e)^(1/2)+1/8*b*c*d*x*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d+e)/(e*x^2+d)
```

Rubi [A]
time = 0.80, antiderivative size = 705, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {4817, 4813, 390, 385, 211, 4825, 4617, 2221, 2317, 2438}

$$\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}+\frac{(a+b\text{ArcSin}(cx))\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}+\frac{(a+b\text{ArcSin}(cx))\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3}-\frac{d^2(a+b\text{ArcSin}(cx))}{4e^3\left(d+ex^2\right)^2}+\frac{d(a+b\text{ArcSin}(cx))}{e^3\left(d+ex^2\right)}-\frac{i(a+b\text{ArcSin}(cx))^2}{2be^3}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^3}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^3}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^3}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^3}+\frac{bc\sqrt{d}\left(2c^2d+e\right)\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8e^3\left(c^2d+e\right)^{3/2}}-\frac{bc\sqrt{d}\,\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}}+\frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*d*x*Sqrt[1 - c^2*x^2])/(8*e^2*(c^2*d + e)*(d + e*x^2)) - (d^2*(a + b*A
rcSin[c*x]))/(4*e^3*(d + e*x^2)^2) + (d*(a + b*ArcSin[c*x]))/(e^3*(d + e*x^
2)) - ((I/2)*(a + b*ArcSin[c*x])^2)/(b*e^3) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2
*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(e^3*Sqrt[c^2*d + e]) + (b*c*Sqrt[
d]*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(
8*e^3*(c^2*d + e)^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*
Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e
^3) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I
```

```
*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^3) - ((I/2)*b*PolyLo
g[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^3
- ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*
d + e])])/e^3 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e]))])/e^3 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^3
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x^5(a+b\sin^{-1}(cx))}{(d+ex^2)^3}\,dx = \int \left(\frac{d^2x(a+b\sin^{-1}(cx))}{e^2(d+ex^2)^3} - \frac{2dx(a+b\sin^{-1}(cx))}{e^2(d+ex^2)^2} + \frac{x(a+b\sin^{-1}(cx))}{e^2(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{e^2} - \frac{(2d)\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx}{e^2} + \frac{d^2\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^3}\,dx}{e^2}$$

$$= -\frac{d^2(a+b\sin^{-1}(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\sin^{-1}(cx))}{e^3(d+ex^2)} - \frac{(bcd)\int \frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{e^3} + \frac{(bc\cdots}{\cdots}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\sin^{-1}(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\sin^{-1}(cx))}{e^3(d+ex^2)} - \frac{(bcd)\text{Subst}\cdots}{\cdots}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\sin^{-1}(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\sin^{-1}(cx))}{e^3(d+ex^2)} - \frac{bc\sqrt{d}\tan\cdots}{e\cdots}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\sin^{-1}(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\sin^{-1}(cx))}{e^3(d+ex^2)} - \frac{i(a+b\sin\cdots}{2be\cdots}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\sin^{-1}(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\sin^{-1}(cx))}{e^3(d+ex^2)} - \frac{i(a+b\sin\cdots}{2be\cdots}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\sin^{-1}(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\sin^{-1}(cx))}{e^3(d+ex^2)} - \frac{i(a+b\sin\cdots}{2be\cdots}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\sin^{-1}(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\sin^{-1}(cx))}{e^3(d+ex^2)} - \frac{i(a+b\sin\cdots}{2be\cdots}$$

Mathematica [A]
time = 4.61, size = 973, normalized size = 1.38

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] ((-4*a*d^2)/(d + e*x^2)^2 + (16*a*d)/(d + e*x^2) + 8*a*Log[d + e*x^2] + b*(
(c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x)) +
```

```
(c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x)) + (7*
Sqrt[d]*ArcSin[c*x])/(Sqrt[d] - I*Sqrt[e]*x) - (d*ArcSin[c*x])/(Sqrt[d] + I
*Sqrt[e]*x)^2 + (7*Sqrt[d]*ArcSin[c*x])/(Sqrt[d] + I*Sqrt[e]*x) + (d*ArcSin
[c*x])/(I*Sqrt[d] + Sqrt[e]*x)^2 - (8*I)*ArcSin[c*x]^2 - (7*c*Sqrt[d]*ArcTa
n[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^
2*d + e] + ((7*I)*c*Sqrt[d]*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d
 + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + 8*ArcSin[c*x]*Log[1 + (Sqrt[e]
*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 8*ArcSin[c*x]*Log[1 +
(Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 8*ArcSin[c*
x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + 8*A
rcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]
)] + (I*c^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqr
t[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))])/(c^2*d +
 e)^(3/2) - (I*c^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*
x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))])/(
c^2*d + e)^(3/2) - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
- Sqrt[c^2*d + e])] - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqr
t[d]) + Sqrt[c^2*d + e])] - (8*I)*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/
(c*Sqrt[d] + Sqrt[c^2*d + e]))] - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(16*e^3)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 6.32, size = 5185, normalized size = 7.35

method	result	size
derivativedivides	Expression too large to display	5185
default	Expression too large to display	5185

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(2*e^(-3)*log(x^2*e + d) + (4*d*x^2*e + 3*d^2)/(x^4*e^5 + 2*d*x^2*e^4 +
 d^2*e^3))*a + b*integrate(x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(
x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e + d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*arcsin(c*x) + a*x^5)/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e +
 d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5(a + b\operatorname{asin}(cx))}{(d + ex^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^5/(e*x^2 + d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,(a + b\operatorname{asin}(c\,x))}{(e\,x^2 + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^5*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.642 $\int \frac{x^3(a+b\mathbf{ArcSin}(cx))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=153

$$-\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{b\text{ArcSin}(cx)}{4de^2}+\frac{x^4(a+b\text{ArcSin}(cx))}{4d\left(d+ex^2\right)^2}+\frac{bc(2c^2d+3e)\,\text{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{8\sqrt{d}\,e^2\left(c^2d+e\right)^{3/2}}$$

```
[Out] -1/4*b*arcsin(c*x)/d/e^2+1/4*x^4*(a+b*arcsin(c*x))/d/(e*x^2+d)^2+1/8*b*c*(2
*c^2*d+3*e)*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d
+e)^(3/2)/d^(1/2)-1/8*b*c*x*(-c^2*x^2+1)^(1/2)/e/(c^2*d+e)/(e*x^2+d)
```

Rubi [A]
time = 0.14, antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$, Rules used = {270, 4815, 12, 481, 537, 222, 385, 211}

$$\frac{x^4(a+b\text{ArcSin}(cx))}{4d\left(d+ex^2\right)^2}-\frac{b\text{ArcSin}(cx)}{4de^2}+\frac{bc(2c^2d+3e)\,\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{8\sqrt{d}\,e^2\left(c^2d+e\right)^{3/2}}-\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] -1/8*(b*c*x*Sqrt[1 - c^2*x^2])/(e*(c^2*d + e)*(d + e*x^2)) - (b*ArcSin[c*x]
)/(4*d*e^2) + (x^4*(a + b*ArcSin[c*x]))/(4*d*(d + e*x^2)^2) + (b*c*(2*c^2*d
 + 3*e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(8*Sqrt[d]
*e^2*(c^2*d + e)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 481

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(-a)*e^(2*n - 1)*(e*x)^(m - 2*n + 1)*(a + b*x^n)
^(p + 1)*((c + d*x^n)^(q + 1)/(b*n*(b*c - a*d)*(p + 1))), x] + Dist[e^(2*n)
/(b*n*(b*c - a*d)*(p + 1)), Int[(e*x)^(m - 2*n)*(a + b*x^n)^(p + 1)*(c + d*
x^n)^q*Simp[a*c*(m - 2*n + 1) + (a*d*(m - n + n*q + 1) + b*c*n*(p + 1))*x^n
, x], x], x] /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[b*c - a*d, 0] && IGtQ[n
, 0] && LtQ[p, -1] && GtQ[m - n + 1, n] && IntBinomialQ[a, b, c, d, e, m, n
, p, q, x]
```

Rule 537

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int \frac{x^3(a+b\sin^{-1}(cx))}{(d+ex^2)^3}\,dx = \frac{x^4(a+b\sin^{-1}(cx))}{4d\,(d+ex^2)^2} - (bc)\int \frac{x^4}{4d\sqrt{1-c^2x^2}\,(d+ex^2)^2}\,dx$$

$$= \frac{x^4(a+b\sin^{-1}(cx))}{4d\,(d+ex^2)^2} - \frac{(bc)\int \frac{x^4}{\sqrt{1-c^2x^2}\,(d+ex^2)^2}\,dx}{4d}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\,(c^2d+e)\,(d+ex^2)} + \frac{x^4(a+b\sin^{-1}(cx))}{4d\,(d+ex^2)^2} + \frac{(bc)\int \frac{d-2(c^2d+e)x^2}{\sqrt{1-c^2x^2}\,(d+ex^2)}\,dx}{8de\,(c^2d+e)}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\,(c^2d+e)\,(d+ex^2)} + \frac{x^4(a+b\sin^{-1}(cx))}{4d\,(d+ex^2)^2} - \frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4de^2} + \frac{(bc(2}{}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\,(c^2d+e)\,(d+ex^2)} - \frac{b\sin^{-1}(cx)}{4de^2} + \frac{x^4(a+b\sin^{-1}(cx))}{4d\,(d+ex^2)^2} + \frac{(bc(2c^2d+3e))}{}$$

$$= -\frac{bcx\sqrt{1-c^2x^2}}{8e\,(c^2d+e)\,(d+ex^2)} - \frac{b\sin^{-1}(cx)}{4de^2} + \frac{x^4(a+b\sin^{-1}(cx))}{4d\,(d+ex^2)^2} + \frac{bc(2c^2d+3e)\,\mathrm{ta}}{8\sqrt{d}}$$

Mathematica [A]
time = 0.36, size = 152, normalized size = 0.99

$$\frac{-\frac{\frac{bcex\sqrt{1-c^2x^2}\,(d+ex^2)}{c^2d+e}+2a(d+2ex^2)}{(d+ex^2)^2} - \frac{2b(d+2ex^2)\,\mathrm{ArcSin}(cx)}{(d+ex^2)^2} + \frac{bc(2c^2d+3e)\,\mathrm{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{\sqrt{d}\,(c^2d+e)^{3/2}}}{8e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (-(((b*c*e*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(c^2*d + e) + 2*a*(d + 2*e*x^2)
)/(d + e*x^2)^2) - (2*b*(d + 2*e*x^2)*ArcSin[c*x])/(d + e*x^2)^2 + (b*c*(2*
c^2*d + 3*e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(Sqrt
[d]*(c^2*d + e)^(3/2)))/(8*e^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1059 vs. 2(133) = 266.
time = 0.11, size = 1060, normalized size = 6.93 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(a*c^6*(-1/2/e^2/(c^2*e*x^2+c^2*d)+1/4/e^2*d*c^2/(c^2*e*x^2+c^2*d)^2)
-1/2*b*c^6*arcsin(c*x)/e^2/(c^2*e*x^2+c^2*d)+1/4*b*c^8*arcsin(c*x)/e^2*d/(c
^2*e*x^2+c^2*d)^2-1/16*b*c^6/e^2/(c^2*d+e)/(c*x+(-c^2*e*d)^(1/2)/e)*(-(c*x+
(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*d+
e)/e)^(1/2)+1/16*b*c^6/e^3*(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*l
n((2*(c^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)
/e)^(1/2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)
^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))-3/16*b*c^6/e^2/(-c^
2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c*
x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*
(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2*
e*d)^(1/2)/e))+3/16*b*c^6/e^2/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c
^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/
2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/
e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))-1/16*b*c^6/e^2/(c^2*d+e)/(
c*x-(-c^2*e*d)^(1/2)/e)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(
c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2)-1/16*b*c^6/e^3*(-c^2*e*d)^(1/2)/
(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(
-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c
^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2*e*d
)^(1/2)/e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(2*x^2*e + d)*a/(x^4*e^4 + 2*d*x^2*e^3 + d^2*e^2) - 1/4*((2*x^2*e + d)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 4*(x^4*e^4 + 2*d*x^2*e^3 + d^
2*e^2)*integrate(1/4*(2*c*x^2*e + c*d)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x +
 1))/(c^4*x^8*e^4 + (2*c^4*d*e^3 - c^2*e^4)*x^6 - c^2*d^2*x^2*e^2 + (c^4*d^
2*e^2 - 2*c^2*d*e^3)*x^4 + (c^2*x^6*e^4 + (2*c^2*d*e^3 - e^4)*x^4 + (c^2*d^
2*e^2 - 2*d*e^3)*x^2 - d^2*e^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))*b/(x
^4*e^4 + 2*d*x^2*e^3 + d^2*e^2)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 449 vs. $2(136) = 272$.
time = 2.46, size = 939, normalized size = 6.14

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/32*(8*a*c^4*d^4 + 16*a*d*x^2*e^3 + (2*b*c^3*d^3 + 3*b*c*x^4*e^3 + 2*(b*
c^3*d*x^4 + 3*b*c*d*x^2)*e^2 + (4*b*c^3*d^2*x^2 + 3*b*c*d^2)*e)*sqrt(-c^2*d
^2 - d*e)*log((8*c^4*d^2*x^4 - 8*c^2*d^2*x^2 + x^4*e^2 - 4*(2*c^2*d*x^3 + x
^3*e - d*x)*sqrt(-c^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1) + d^2 + 2*(4*c^2*d*x^4
- 3*d*x^2)*e)/(x^4*e^2 + 2*d*x^2*e + d^2)) + 8*(b*c^4*d^4 + 2*b*d*x^2*e^3 +
 (4*b*c^2*d^2*x^2 + b*d^2)*e^2 + 2*(b*c^4*d^3*x^2 + b*c^2*d^3)*e)*arcsin(c*
x) + 8*(4*a*c^2*d^2*x^2 + a*d^2)*e^2 + 16*(a*c^4*d^3*x^2 + a*c^2*d^3)*e + 4
*(b*c^3*d^3*x*e + b*c*d*x^3*e^3 + (b*c^3*d^2*x^3 + b*c*d^2*x)*e^2)*sqrt(-c^
2*x^2 + 1))/(c^4*d^5*e^2 + d*x^4*e^6 + 2*(c^2*d^2*x^4 + d^2*x^2)*e^5 + (c^4
*d^3*x^4 + 4*c^2*d^3*x^2 + d^3)*e^4 + 2*(c^4*d^4*x^2 + c^2*d^4)*e^3), -1/16
*(4*a*c^4*d^4 + 8*a*d*x^2*e^3 + (2*b*c^3*d^3 + 3*b*c*x^4*e^3 + 2*(b*c^3*d*x
^4 + 3*b*c*d*x^2)*e^2 + (4*b*c^3*d^2*x^2 + 3*b*c*d^2)*e)*sqrt(c^2*d^2 + d*e
)*arctan(1/2*(2*c^2*d*x^2 + x^2*e - d)*sqrt(c^2*d^2 + d*e)*sqrt(-c^2*x^2 +
1)/(c^4*d^2*x^3 - c^2*d^2*x + (c^2*d*x^3 - d*x)*e)) + 4*(b*c^4*d^4 + 2*b*d*
x^2*e^3 + (4*b*c^2*d^2*x^2 + b*d^2)*e^2 + 2*(b*c^4*d^3*x^2 + b*c^2*d^3)*e)*
arcsin(c*x) + 4*(4*a*c^2*d^2*x^2 + a*d^2)*e^2 + 8*(a*c^4*d^3*x^2 + a*c^2*d^
3)*e + 2*(b*c^3*d^3*x*e + b*c*d*x^3*e^3 + (b*c^3*d^2*x^3 + b*c*d^2*x)*e^2)*
sqrt(-c^2*x^2 + 1))/(c^4*d^5*e^2 + d*x^4*e^6 + 2*(c^2*d^2*x^4 + d^2*x^2)*e^
5 + (c^4*d^3*x^4 + 4*c^2*d^3*x^2 + d^3)*e^4 + 2*(c^4*d^4*x^2 + c^2*d^4)*e^3
)]
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3(a + b\,\mathrm{asin}\,(cx))}{(d + ex^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,(a + b\,\mathrm{asin}(c\,x))}{(e\,x^2 + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
[Out] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.643 $\int \frac{x(a+b\text{ArcSin}(cx))}{(d+ex^2)^3} dx$

Optimal. Leaf size=133

$$\frac{bcx\sqrt{1-c^2x^2}}{8d(c^2d+e)(d+ex^2)} - \frac{a+b\text{ArcSin}(cx)}{4e(d+ex^2)^2} + \frac{bc(2c^2d+e)\,\text{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e(c^2d+e)^{3/2}}$$

```
[Out] 1/4*(-a-b*arcsin(c*x))/e/(e*x^2+d)^2+1/8*b*c*(2*c^2*d+e)*arctan(x*(c^2*d+e)
^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(3/2)/e/(c^2*d+e)^(3/2)+1/8*b*c*x*(-c^
2*x^2+1)^(1/2)/d/(c^2*d+e)/(e*x^2+d)
```

Rubi [A]
time = 0.07, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.210$, Rules used = {4813, 390, 385, 211}

$$-\frac{a+b\text{ArcSin}(cx)}{4e(d+ex^2)^2} + \frac{bc(2c^2d+e)\,\text{ArcTan}\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e(c^2d+e)^{3/2}} + \frac{bcx\sqrt{1-c^2x^2}}{8d(c^2d+e)(d+ex^2)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2])/(8*d*(c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x
])/(4*e*(d + e*x^2)^2) + (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqr
t[d]*Sqrt[1 - c^2*x^2])])/(8*d^(3/2)*e*(c^2*d + e)^(3/2))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
```

```
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^3}\,dx &= -\frac{a+b\sin^{-1}(cx)}{4e\,(d+ex^2)^2}+\frac{(bc)\int \frac{1}{\sqrt{1-c^2x^2}\,(d+ex^2)^2}\,dx}{4e}\\
&= \frac{bcx\sqrt{1-c^2x^2}}{8d\,(c^2d+e)\,(d+ex^2)}-\frac{a+b\sin^{-1}(cx)}{4e\,(d+ex^2)^2}+\frac{(bc(2c^2d+e))\int \frac{1}{\sqrt{1-c^2x^2}\,(d+ex^2)}\,dx}{8de\,(c^2d+e)}\\
&= \frac{bcx\sqrt{1-c^2x^2}}{8d\,(c^2d+e)\,(d+ex^2)}-\frac{a+b\sin^{-1}(cx)}{4e\,(d+ex^2)^2}+\frac{(bc(2c^2d+e))\,\mathrm{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,d\ldots\right.}{8de\,(c^2d+e)}\\
&= \frac{bcx\sqrt{1-c^2x^2}}{8d\,(c^2d+e)\,(d+ex^2)}-\frac{a+b\sin^{-1}(cx)}{4e\,(d+ex^2)^2}+\frac{bc(2c^2d+e)\tan^{-1}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e\,(c^2d+e)^{3/2}}
\end{aligned}$$

Mathematica [A]
time = 0.39, size = 141, normalized size = 1.06

$$\frac{1}{8}\left(\frac{-\frac{2a}{e}+\frac{bcx\sqrt{1-c^2x^2}\,(d+ex^2)}{d(c^2d+e)}}{(d+ex^2)^2}-\frac{2b\mathrm{ArcSin}(cx)}{e\,(d+ex^2)^2}+\frac{bc(2c^2d+e)\,\mathrm{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{d^{3/2}e\,(c^2d+e)^{3/2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((-2*a)/e + (b*c*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(d*(c^2*d + e)))/(d + e*
x^2)^2 - (2*b*ArcSin[c*x])/(e*(d + e*x^2)^2) + (b*c*(2*c^2*d + e)*ArcTan[(S
qrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(d^(3/2)*e*(c^2*d + e)^(3/2
)))/8
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1020 vs. 2(118) = 236.
time = 0.12, size = 1021, normalized size = 7.68

method	result
derivativedivides	$\frac{-\frac{a\,c^6}{4e\left(c^2e\,x^2+c^2d\right)^2}-\frac{b\,c^6\arcsin(cx)}{4\left(c^2e\,x^2+c^2d\right)^2e}+\frac{b\,c^4\sqrt{-\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)^2+\frac{2\sqrt{-c^2ed}\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)}{e}+}}{16ed\left(c^2d+e\right)\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)}}{}$
default	$\frac{-\frac{a\,c^6}{4e\left(c^2e\,x^2+c^2d\right)^2}-\frac{b\,c^6\arcsin(cx)}{4\left(c^2e\,x^2+c^2d\right)^2e}+\frac{b\,c^4\sqrt{-\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)^2+\frac{2\sqrt{-c^2ed}\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)}{e}+}}{16ed\left(c^2d+e\right)\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/4*a*c^6/e/(c^2*e*x^2+c^2*d)^2-1/4*b*c^6/(c^2*e*x^2+c^2*d)^2*arcsi
n(c*x)/e+1/16*b*c^4/e/d/(c^2*d+e)/(c*x+(-c^2*e*d)^(1/2)/e)*(-(c*x+(-c^2*e*d
)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/
2)-1/16*b*c^4/e^2/d*(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c
^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/
2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/
e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))-1/16*b*c^4/e/d/(-c^2*e*d)^
(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2
*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e
*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2*e*d)^(1
/2)/e))+1/16*b*c^4/e/d/(c^2*d+e)/(c*x-(-c^2*e*d)^(1/2)/e)*(-(c*x-(-c^2*e*d)
^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2
)+1/16*b*c^4/e^2/d*(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^
2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2
)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e
)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2*e*d)^(1/2)/e))+1/16*b*c^4/e/d/(-c^2*e*d)^(
1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*
e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*
d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/
2)/e)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(4*(c*x^4*e^3 + 2*c*d*x^2*e^2 + c*d^2*e)*integrate(1/4*e^(1/2*log(c*x
+ 1) + 1/2*log(-c*x + 1))/(c^4*x^8*e^3 + (2*c^4*d*e^2 - c^2*e^3)*x^6 - c^2*
d^2*x^2*e + (c^4*d^2*e - 2*c^2*d*e^2)*x^4 + (c^2*x^6*e^3 + (2*c^2*d*e^2 - e
^3)*x^4 + (c^2*d^2*e - 2*d*e^2)*x^2 - d^2*e)*e^(log(c*x + 1) + log(-c*x + 1
))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(x^4*e^3 + 2*d*x^2*
e^2 + d^2*e) - 1/4*a/(x^4*e^3 + 2*d*x^2*e^2 + d^2*e)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 376 vs. $2(119) = 238$.
time = 8.01, size = 793, normalized size = 5.96

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/32*(8*a*c^4*d^4 + 16*a*c^2*d^3*e + 8*a*d^2*e^2 + (2*b*c^3*d^3 + b*c*x^4
*e^3 + 2*(b*c^3*d*x^4 + b*c*d*x^2)*e^2 + (4*b*c^3*d^2*x^2 + b*c*d^2)*e)*sqr
t(-c^2*d^2 - d*e)*log((8*c^4*d^2*x^4 - 8*c^2*d^2*x^2 + x^4*e^2 - 4*(2*c^2*d
*x^3 + x^3*e - d*x)*sqrt(-c^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1) + d^2 + 2*(4*c^
2*d*x^4 - 3*d*x^2)*e)/(x^4*e^2 + 2*d*x^2*e + d^2)) + 8*(b*c^4*d^4 + 2*b*c^2
*d^3*e + b*d^2*e^2)*arcsin(c*x) - 4*(b*c^3*d^3*x*e + b*c*d*x^3*e^3 + (b*c^3
*d^2*x^3 + b*c*d^2*x)*e^2)*sqrt(-c^2*x^2 + 1))/(c^4*d^6*e + d^2*x^4*e^5 + 2
*(c^2*d^3*x^4 + d^3*x^2)*e^4 + (c^4*d^4*x^4 + 4*c^2*d^4*x^2 + d^4)*e^3 + 2*
(c^4*d^5*x^2 + c^2*d^5)*e^2), -1/16*(4*a*c^4*d^4 + 8*a*c^2*d^3*e + 4*a*d^2*
e^2 + (2*b*c^3*d^3 + b*c*x^4*e^3 + 2*(b*c^3*d*x^4 + b*c*d*x^2)*e^2 + (4*b*c
^3*d^2*x^2 + b*c*d^2)*e)*sqrt(c^2*d^2 + d*e)*arctan(1/2*(2*c^2*d*x^2 + x^2*
e - d)*sqrt(c^2*d^2 + d*e)*sqrt(-c^2*x^2 + 1)/(c^4*d^2*x^3 - c^2*d^2*x + (c
^2*d*x^3 - d*x)*e)) + 4*(b*c^4*d^4 + 2*b*c^2*d^3*e + b*d^2*e^2)*arcsin(c*x)
 - 2*(b*c^3*d^3*x*e + b*c*d*x^3*e^3 + (b*c^3*d^2*x^3 + b*c*d^2*x)*e^2)*sqrt
(-c^2*x^2 + 1))/(c^4*d^6*e + d^2*x^4*e^5 + 2*(c^2*d^3*x^4 + d^3*x^2)*e^4 +
(c^4*d^4*x^4 + 4*c^2*d^4*x^2 + d^4)*e^3 + 2*(c^4*d^5*x^2 + c^2*d^5)*e^2)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(a + b\operatorname{asin}(cx))}{(d + ex^2)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{{(e\,x^2+d)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.644 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=727

$$-\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\mathrm{ArcSin}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\mathrm{ArcSin}(cx)}{2d^2\left(d+ex^2\right)}-\frac{bc\mathrm{ArcTan}\left(\frac{\sqrt{c^2d+e}\,x}{\sqrt{d}\,\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}}-\frac{bc(2c^2d+e)\ldots}{8d\ldots}$$

```
[Out] 1/4*(a+b*arcsin(c*x))/d/(e*x^2+d)^2+1/2*(a+b*arcsin(c*x))/d^2/(e*x^2+d)-1/8
*b*c*(2*c^2*d+e)*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(5/
2)/(c^2*d+e)^(3/2)+(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3
-1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)-(c^2*d+e)^(1/2)))/d^3-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3-1/2*(a+b*arcsin(c*x))*ln
(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3
-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)+(c^2*d+e)^(1/2)))/d^3-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d
^3+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c
^2*d+e)^(1/2)))/d^3+1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I
*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^
(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3+1/2*I*b*polylog(2,(I*c
*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3-1/2*b*
c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(5/2)/(c^2*d+e)^(1
/2)-1/8*b*c*e*x*(-c^2*x^2+1)^(1/2)/d^2/(c^2*d+e)/(e*x^2+d)
```

Rubi [A]

time = 0.82, antiderivative size = 727, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {4817, 4721, 3798, 2221, 2317, 2438, 4813, 390, 385, 211, 4825, 4617}

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3),x]
```

```
[Out] -1/8*(b*c*e*x*Sqrt[1 - c^2*x^2])/(d^2*(c^2*d + e)*(d + e*x^2)) + (a + b*Arc
Sin[c*x])/(4*d*(d + e*x^2)^2) + (a + b*ArcSin[c*x])/(2*d^2*(d + e*x^2)) - (
b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqr
t[c^2*d + e]) - (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt
[1 - c^2*x^2])])/(8*d^(5/2)*(c^2*d + e)^(3/2)) - ((a + b*ArcSin[c*x])*Log[1
 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^3) -
 ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])
```

```
*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*
d^3) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 + ((I/2)*b*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e])])/d^3 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 - ((I/2)*b*PolyLog[2, E^
((2*I)*ArcSin[c*x])])/d^3
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x\left(d+ex^2\right)^3}\,dx=\int\left(\frac{a+b\sin^{-1}(cx)}{d^3x}-\frac{ex(a+b\sin^{-1}(cx))}{d\left(d+ex^2\right)^3}-\frac{ex(a+b\sin^{-1}(cx))}{d^2\left(d+ex^2\right)^2}-\frac{ex(a+b\sin^{-1}(\right.$$

$$=\frac{\int\frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^3}-\frac{e\int\frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{d^3}-\frac{e\int\frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^2}\,dx}{d^2}-\frac{e\int\frac{x(a+b\sin^{-1}(cx))}{(d+ex^2)^3}}{d}$$

$$=\frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)}+\frac{\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\sin^{-1}(cx)\right)}{d^3}-$$

$$=-\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)}-\frac{i(a+b\sin^{-1}(cx))^2}{2bd^3}$$

$$=-\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)}-\frac{i(a+b\sin^{-1}(cx))^2}{2bd^3}$$

$$=-\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)}-\frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d}}{\sqrt{d}\sqrt{1}}\right.}{2d^{5/2}\sqrt{c^2d+}}$$

$$=-\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)}-\frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d}}{\sqrt{d}\sqrt{1}}\right.}{2d^{5/2}\sqrt{c^2d+}}$$

$$=-\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)}-\frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d}}{\sqrt{d}\sqrt{1}}\right.}{2d^{5/2}\sqrt{c^2d+}}$$

$$=-\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\sin^{-1}(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\sin^{-1}(cx)}{2d^2\left(d+ex^2\right)}-\frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d}}{\sqrt{d}\sqrt{1}}\right.}{2d^{5/2}\sqrt{c^2d+}}$$

Mathematica [F]

time = 4.69, size = 0, normalized size = 0.00

$$\int\frac{a+b\text{ArcSin}(cx)}{x\left(d+ex^2\right)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3),x]
[Out] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3), x]
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.67, size = 1373, normalized size = 1.89

method	result	size
derivativedivides	Expression too large to display	1373
default	Expression too large to display	1373

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d^3*ln(c^2*e*x^2+c^2*d)+1/8*I*b*c^6/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e
)*e^2*x^4+1/2*b*c^4/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*e^2*x^2+1
/4*I*b*c^6/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e*x^2+1/2*b*c^6/d/(c^2*e*x^2+c^2
*d)^2/(c^2*d+e)*arcsin(c*x)*e*x^2-1/8*b*c^5/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)
*(-c^2*x^2+1)^(1/2)*e*x-1/8*b*c^5/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x
^2+1)^(1/2)*e^2*x^3+I*b/d^3/(c^2*d+e)*e*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+a/d
^3*ln(c*x)+1/4*a*c^4/d/(c^2*e*x^2+c^2*d)^2+1/2*a*c^2/d^2/(c^2*e*x^2+c^2*d)+
b/d^3/(c^2*d+e)*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*b*c^2/d^2/(c
^2*d+e)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+b*c^2/d^2/(c^2*d+e)*arcsin(c*x)*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2))+1/4*I*b/d^3/(c^2*d+e)*e*sum((-_R1^2*e+4*c^2*d+e
)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1
)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*
e)*_Z^2+e))-I*b/d^3/(c^2*d+e)*e*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/4*I*b/d
^3/(c^2*d+e)*e^2*sum((_R1^2-1)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-
I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_
R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/4*I*b*c^2/d^2/(c^2*d+e)*sum((-_R
1^2*e+4*c^2*d+e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^
2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z
^4+(-4*c^2*d-2*e)*_Z^2+e))-I*b*c^2/d^2/(c^2*d+e)*dilog(1+I*c*x+(-c^2*x^2+1)
^(1/2))+3/4*b*c^4/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e*arcsin(c*x)-5/8*I*b*(d*
c^2*(c^2*d+e))^(1/2)/d^3/(c^2*d+e)^2*arctanh(1/4*(4*c^2*d-2*e*(I*c*x+(-c^2*
x^2+1)^(1/2))^2+2*e)/(c^4*d^2+c^2*d*e)^(1/2))*e-3/4*I*b*c^2*(d*c^2*(c^2*d+e
))^(1/2)/d^2/(c^2*d+e)^2*arctanh(1/4*(4*c^2*d-2*e*(I*c*x+(-c^2*x^2+1)^(1/2)
)^2+2*e)/(c^4*d^2+c^2*d*e)^(1/2))-1/4*I*b*c^2/d^2/(c^2*d+e)*sum((_R1^2-1)/(
-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+d
ilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*
_Z^2+e))*e+3/4*b*c^6/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)+1/8*I*b*c^6/
(c^2*e*x^2+c^2*d)^2/(c^2*d+e)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((2*x^2*e + 3*d)/(d^2*x^4*e^2 + 2*d^3*x^2*e + d^4) - 2*log(x^2*e + d)
/d^3 + 4*log(x)/d^3) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))/(x^7*e^3 + 3*d*x^5*e^2 + 3*d^2*x^3*e + d^3*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^7*e^3 + 3*d*x^5*e^2 + 3*d^2*x^3*e + d^3*x),
 x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\operatorname{asin}(cx)}{x(d + ex^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d)**3,x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(d + e*x**2)**3), x)
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\operatorname{asin}(c\,x)}{x\,(e\,x^2 + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d + e*x^2)^3), x)
```

3.645 $\int \frac{a+b\mathbf{ArcSin}(cx)}{x^3(d+ex^2)^3}\,dx$

Optimal. Leaf size=783

$$-\frac{bc\sqrt{1-c^2x^2}}{2d^3x}+\frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\,(c^2d+e)\,(d+ex^2)}-\frac{a+b\text{ArcSin}(cx)}{2d^3x^2}-\frac{e(a+b\text{ArcSin}(cx))}{4d^2\,(d+ex^2)^2}-\frac{e(a+b\text{ArcSin}(cx))}{d^3\,(d+ex^2)}+\frac{bceA}{}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/d^3/x^2-1/4*e*(a+b*arcsin(c*x))/d^2/(e*x^2+d)^2-e*(a
+b*arcsin(c*x))/d^3/(e*x^2+d)+1/8*b*c*e*(2*c^2*d+e)*arctan(x*(c^2*d+e)^(1/2
)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(7/2)/(c^2*d+e)^(3/2)-3*e*(a+b*arcsin(c*x))
*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^4+3/2*e*(a+b*arcsin(c*x))*ln(1-(I*c*x
+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^4+3/2*e*(a
+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^
2*d+e)^(1/2)))/d^4+3/2*e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^4+3/2*e*(a+b*arcsin(c*x))*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^4-3/
2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))/d^4+3/2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^4-3/2*I
*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e
)^(1/2)))/d^4-3/2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(
-d)^(1/2)-(c^2*d+e)^(1/2)))/d^4-3/2*I*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^4+b*c*e*arctan(x*(c^2*d+e)
^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(7/2)/(c^2*d+e)^(1/2)-1/2*b*c*(-c^2*x^
2+1)^(1/2)/d^3/x+1/8*b*c*e^2*x*(-c^2*x^2+1)^(1/2)/d^3/(c^2*d+e)/(e*x^2+d)
```

Rubi [A]
time = 0.86, antiderivative size = 783, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 14, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {4817, 4723, 270, 4721, 3798, 2221, 2317, 2438, 4813, 390, 385, 211, 4825, 4617}

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d^3*x) + (b*c*e^2*x*Sqrt[1 - c^2*x^2])/(8*d^3
*(c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x])/(2*d^3*x^2) - (e*(a + b*Arc
Sin[c*x]))/(4*d^2*(d + e*x^2)^2) - (e*(a + b*ArcSin[c*x]))/(d^3*(d + e*x^2)
) + (b*c*e*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(d^(7/2
)*Sqrt[c^2*d + e]) + (b*c*e*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[
d]*Sqrt[1 - c^2*x^2])])/(8*d^(7/2)*(c^2*d + e)^(3/2)) + (3*e*(a + b*ArcSin[
c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])]
```

```
)/(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^4) + (
3*e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] +
 Sqrt[c^2*d + e])])/(2*d^4) - (3*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Arc
Sin[c*x])])/d^4 - (((3*I)/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(
I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^4 - (((3*I)/2)*b*e
*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))
])/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/d^4 + (((3*I)/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x]
)])/d^4
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{x^3\left(d+ex^2\right)^3}\,dx = \int \left(\frac{a+b\sin^{-1}(cx)}{d^3x^3} - \frac{3e(a+b\sin^{-1}(cx))}{d^4x} + \frac{e^2x(a+b\sin^{-1}(cx))}{d^2\left(d+ex^2\right)^3} + \frac{2e^2x(a+b\sin^{-}}{d^3\left(d+ex^2\right.}\right.$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{x^3}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{x}\,dx}{d^4} + \frac{(3e^2)\int \frac{x(a+b\sin^{-1}(cx))}{d+ex^2}\,dx}{d^4} + \frac{(2e^2)\int \frac{x(a+b\sin}{(d+e}}{d^3}$$

$$= -\frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e(a+b\sin^{-1}(cx))}{4d^2\left(d+ex^2\right)^2} - \frac{e(a+b\sin^{-1}(cx))}{d^3\left(d+ex^2\right)} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,d}{2d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e(a+b\sin^{-1}(cx))}{4d^2\left(d+ex^2\right)^2} -$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e(a+b\sin^{-1}(cx))}{4d^2\left(d+ex^2\right)^2} -$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e(a+b\sin^{-1}(cx))}{4d^2\left(d+ex^2\right)^2} -$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e(a+b\sin^{-1}(cx))}{4d^2\left(d+ex^2\right)^2} -$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e(a+b\sin^{-1}(cx))}{4d^2\left(d+ex^2\right)^2} -$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\sin^{-1}(cx)}{2d^3x^2} - \frac{e(a+b\sin^{-1}(cx))}{4d^2\left(d+ex^2\right)^2} -$$

Mathematica [F]
time = 6.33, size = 0, normalized size = 0.00

$$\int \frac{a+b\text{ArcSin}(cx)}{x^3\left(d+ex^2\right)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3),x]
[Out] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3), x]
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.68, size = 1820, normalized size = 2.32

method	result	size
derivativedivides	Expression too large to display	1820
default	Expression too large to display	1820

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(5/4*I*b*(d*c^2*(c^2*d+e))^(1/2)/d^3/(c^2*d+e)^2*arctanh(1/4*(4*c^2*d-2
*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2+2*e)/(c^4*d^2+c^2*d*e)^(1/2))*e-3*I*b/c^2/d
^4*e^2/(c^2*d+e)*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-3/4*I*b/c^2/d^4*e^2/(c^2*d
+e)*sum((-_R1^2*e+4*c^2*d+e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*
c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1
=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+3*I*b/c^2/d^4*e^2/(c^2*d+e)*dilog(1+
I*c*x+(-c^2*x^2+1)^(1/2))+3/8*I*b*c^4/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e+3/4
*I*b/c^2/d^4*e^3/(c^2*d+e)*sum((_R1^2-1)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x
)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2
))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/2*b*c^5/x/(c^2*e*x^2+c
^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)-1/2*b*c^4/x^2/(c^2*e*x^2+c^2*d)^2/(c^2
*d+e)*arcsin(c*x)-3*b/c^2/d^4*e^2/(c^2*d+e)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^
2+1)^(1/2))-9/4*b*c^2/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*e^2-3/2
*b*c^4/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c*x)*e^2*x^2-b*c^5/d/(c^2*e
*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)*e*x-1/2*b*c^5/d^2/(c^2*e*x^2+c^2
*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)*e^2*x^3-1/4*a*c^2*e/d^2/(c^2*e*x^2+c^2*d
)^2+3/2*a/c^2*e/d^4*ln(c^2*e*x^2+c^2*d)-3*a/c^2/d^4*e*ln(c*x)+1/2*I*b*c^6/(
c^2*e*x^2+c^2*d)^2/(c^2*d+e)+9/8*I*b/c^2*(d*c^2*(c^2*d+e))^(1/2)/d^4/(c^2*d
+e)^2*arctanh(1/4*(4*c^2*d-2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2+2*e)/(c^4*d^2+c
^2*d*e)^(1/2))*e^2-3/2*b*c^2*x^2/d^3/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*arcsin(c
*x)*e^3-3/8*b*c^3*x^3/d^3/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)*
e^3+3/8*I*b*c^4*x^4/d^3/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e^3+3/4*I*b*c^4*x^2/d
^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e^2-3*I*b/d^3/(c^2*d+e)*e*dilog(I*c*x+(-c^
2*x^2+1)^(1/2))-3/4*I*b/d^3*e/(c^2*d+e)*sum((-_R1^2*e+4*c^2*d+e)/(-_R1^2*e+
2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1
-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+
3*I*b/d^3*e/(c^2*d+e)*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+3/4*I*b/d^3*e^2/(c^
2*d+e)*sum((_R1^2-1)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^
2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(
e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-a*e/d^3/(c^2*e*x^2+c^2*d)-1/2*a/d^3/c^2/x^2-
3*b/d^3/(c^2*d+e)*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-9/4*b*c^4/d/
(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e*arcsin(c*x)-1/2*b*c^3/x/d/(c^2*e*x^2+c^2*d)
^2/(c^2*d+e)*(-c^2*x^2+1)^(1/2)*e-7/8*b*c^3*x/d^2/(c^2*e*x^2+c^2*d)^2/(c^2*
d+e)*(-c^2*x^2+1)^(1/2)*e^2-1/2*b*c^2/x^2/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e
```

```
*arcsin(c*x)+I*b*c^6*x^2/d/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e+1/2*I*b*c^6*x^4/
d^2/(c^2*e*x^2+c^2*d)^2/(c^2*d+e)*e^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*x^4*e^2 + 9*d*x^2*e + 2*d^2)/(d^3*x^6*e^2 + 2*d^4*x^4*e + d^5*x^
2) - 6*e*log(x^2*e + d)/d^4 + 12*e*log(x)/d^4) + b*integrate(arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))/(x^9*e^3 + 3*d*x^7*e^2 + 3*d^2*x^5*e + d^3*x^3
), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^9*e^3 + 3*d*x^7*e^2 + 3*d^2*x^5*e + d^3*x^3
), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^3),x)
[Out] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^3), x)
```

3.646 $\int \frac{x^4(a+b\mathbf{ArcSin}(cx))}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=1082

$$\frac{bc\sqrt{-d}\,\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{-d}\,\sqrt{1-c^2x^2}}{16e^2\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{\sqrt{-d}\,(a+b\text{ArcSin}(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)^2}+\frac{5(a+b\text{ArcS}}{16e^{5/2}\left(\sqrt{-d}\right.}$$

```
[Out] 1/16*b*c^3*d*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+
1)^(1/2))/e^(5/2)/(c^2*d+e)^(3/2)+1/16*b*c^3*d*arctanh((c^2*x*(-d)^(1/2)+e^
(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(5/2)/(c^2*d+e)^(3/2)+3/16*(a+
b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)+3
/16*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)+(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^
(1/2)+3/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2
)+(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)+3/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2
+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-3/1
6*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e
)^(1/2)))/e^(5/2)/(-d)^(1/2)-3/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-1/16*(a+b*arcs
in(c*x))*(-d)^(1/2)/e^(5/2)/((-d)^(1/2)-x*e^(1/2))^2+5/16*(a+b*arcsin(c*x))
/e^(5/2)/((-d)^(1/2)-x*e^(1/2))+1/16*(a+b*arcsin(c*x))*(-d)^(1/2)/e^(5/2)/(
(-d)^(1/2)+x*e^(1/2))^2-5/16*(a+b*arcsin(c*x))/e^(5/2)/((-d)^(1/2)+x*e^(1/2
))-5/16*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1
)^(1/2))/e^(5/2)/(c^2*d+e)^(1/2)-5/16*b*c*arctanh((c^2*x*(-d)^(1/2)+e^(1/2)
)/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(5/2)/(c^2*d+e)^(1/2)+1/16*b*c*(-d)
^(1/2)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d+e)/((-d)^(1/2)-x*e^(1/2))+1/16*b*c*(-d
)^(1/2)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d+e)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A]
time = 2.41, antiderivative size = 1082, normalized size of antiderivative = 1.00, number of steps used = 80, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.524$, Rules used = {4817, 4757, 4827, 745, 739, 212, 4825, 4617, 2221, 2317, 2438}

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x)
) + (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] + Sqrt[e
```

```
]*x)) - (Sqrt[-d]*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)^2
) + (5*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (Sqrt[-d]
*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)^2) - (5*(a + b*Arc
Sin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*d*ArcTanh[(Sqrt[e]
- c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(5/2)*(c^2*d
+ e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sq
rt[1 - c^2*x^2])])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (b*c^3*d*ArcTanh[(Sqrt[e]
 + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(5/2)*(c^2*d
 + e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (3*(a + b*ArcSin[c*x])*L
og[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*S
qrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + (3*(a + b*Arc
Sin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e])])/(16*Sqrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + ((
(3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2)) + (((3*I
)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
 + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
```

```
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^4(a+b\sin^{-1}(cx))}{(d+ex^2)^3}\,dx = \int \left(\frac{d^2(a+b\sin^{-1}(cx))}{e^2(d+ex^2)^3} - \frac{2d(a+b\sin^{-1}(cx))}{e^2(d+ex^2)^2} + \frac{a+b\sin^{-1}(cx)}{e^2(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{a+b\sin^{-1}(cx)}{d+ex^2}\,dx}{e^2} - \frac{(2d)\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^2}\,dx}{e^2} + \frac{d^2\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^3}\,dx}{e^2}$$

$$= \frac{\int \left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx}{e^2} - \frac{(2d)\int \left(-\frac{e(a+b\sin^{-1}(cx))}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)} \right.}{}$$

$$= -\frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2\sqrt{-d}\,e^2} - \frac{\int \frac{a+b\sin^{-1}(cx)}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2\sqrt{-d}\,e^2} - \frac{3\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{16e} - \frac{3\int \frac{a+}{\left(\sqrt{-\right.}}$$

$$= -\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)^2} + \frac{5(a+b\sin^{-1}(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\sqrt{-d}\,(a+b\sin^{-1}(cx)}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}\,x\right.}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{\sqrt{-d}\,(a}{16e^{5/2}\left(\sqrt{\right.}}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{\sqrt{-d}\,(a}{16e^{5/2}\left(\sqrt{\right.}}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{\sqrt{-d}\,(a}{16e^{5/2}\left(\sqrt{\right.}}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{\sqrt{-d}\,(a}{16e^{5/2}\left(\sqrt{\right.}}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{\sqrt{-d}\,(a}{16e^{5/2}\left(\sqrt{\right.}}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \frac{\sqrt{-d}\,(a}{16e^{5/2}\left(\sqrt{\right.}}$$

Mathematica [A]
time = 3.97, size = 1014, normalized size = 0.94

[illegible]

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((-I)*b*c*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] +
Sqrt[e]*x)) + (I*b*c*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqr
t[d] + Sqrt[e]*x)) + (4*a*d*Sqrt[e]*x)/(d + e*x^2)^2 - (10*a*Sqrt[e]*x)/(d
+ e*x^2) + (I*b*Sqrt[d]*ArcSin[c*x])/(Sqrt[d] + I*Sqrt[e]*x)^2 + (I*b*Sqrt[
d]*ArcSin[c*x])/(I*Sqrt[d] + Sqrt[e]*x)^2 - (5*b*ArcSin[c*x])/(I*Sqrt[d] +
Sqrt[e]*x) + (6*a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[d] - (5*I)*b*(ArcSin[c*
x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^
2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (5*b*c*ArcTanh[(Sqrt[e] +
I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + ((
3*I)*b*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqr
t[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*
d + e])]))/Sqrt[d] - ((3*I)*b*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c
*Sqrt[d] + Sqrt[c^2*d + e])]))/Sqrt[d] + (b*c^3*d*(Log[4] + Log[(e*Sqrt[c^2
*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c
^3*(d + I*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) + (b*c^3*d*(Log[4] + Log
[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c
^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) + (3*b*PolyL
og[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])])/Sqrt[d] -
 (3*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e
])])/Sqrt[d] - (3*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + S
qrt[c^2*d + e]))])/Sqrt[d] + (3*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c
*Sqrt[d] + Sqrt[c^2*d + e])])/Sqrt[d])/(16*e^(5/2))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 8.03, size = 3126, normalized size = 2.89

method	result	size
derivativedivides	Expression too large to display	3126
default	Expression too large to display	3126

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-b*c^8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*
c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d
/e^5/(c^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)-7/4*b*c^8*((2*c^2*d+2*(d*c^2*(c^2*d+
```

e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c
^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)*d+
7/4*b*c^8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+
(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(
c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)*d-b*c^10*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(
1/2)+e)*e)^(1/2)*d^2*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^
2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^5/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)+b*c
^8*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x
^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d/e^5/(c^2*d+
e)*(d*c^2*(c^2*d+e))^(1/2)+b*c^10*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)
)^(1/2)*d^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+
e))^(1/2)-e)*e)^(1/2))/e^5/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)+3/8*a*c^5/e^
2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-3/16*b*c^6/e/(c^2*d+e)*sum(_R1/(-_R1^
2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog(
(_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+
e))-3/16*b*c^6/e/(c^2*d+e)*sum(1/_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln
((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_
R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-7/4*b*c^8*(-e*(2*c^2*d-2*(d*
c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2
d+2(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)*d+b*c^12*((2*c^2*d+
2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*d^3*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^5/(c^2*d+e)^2-b*c^10
*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2
+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d^2/e^5/(c^2*d+
e)+b*c^12*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*d^3*arctan(e*(I*
c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e
^5/(c^2*d+e)^2-b*c^10*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arct
an(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^
(1/2))*d^2/e^5/(c^2*d+e)-3/8*a*c^9/(c^2*e*x^2+c^2*d)^2/e^2*d*x-5/4*b*c^6*(-
e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)
^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)*(d*
c^2*(c^2*d+e))^(1/2)-5/8*b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1
/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2
)+e)*e)^(1/2))/e^3/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)-3/8*b*c^11/e^2/(c^2*
d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*d^2*x-3/16*b*c^8/e^2/(c^2*d+e)*d*sum(_
R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R
1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2
*e)*_Z^2+e))-5/8*b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arct
anh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^
(1/2))/e^3/(c^2*d+e)-5/8*b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(
1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/
2)-e)*e)^(1/2))/e^3/(c^2*d+e)-3/16*b*c^8/e^2/(c^2*d+e)*d*sum(1/_R1/(-_R1^2*
e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_
R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)
)-5/8*b*c^11/e/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*d*x^3+1/8*b*c^10/e

```
/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)*d*x^2-3/8*b*c^9/e/(c^2*d+
e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*d*x-5/8*a*c^9/(c^2*e*x^2+c^2*d)^2/e*x^3+
5/4*b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+
(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c
^2*d+e)*(d*c^2*(c^2*d+e))^(1/2)+5/8*b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^
(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^
2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)+1/8*b*c^
10/e^2/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*d^2*(-c^2*x^2+1)^(1/2)+9/4*b*c^10*((2*
c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(
1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)^2*d^2+
5/4*b*c^8*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+
(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c
^2*d+e)^2*d-7/4*b*c^8*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arcta
nh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(
1/2))/e^4/(c^2*d+e)*d+9/4*b*c^10*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))
^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(
1/2)-e)*e)^(1/2))/e^4/(c^2*d+e)^2*d^2+5/4*b*c^8*(-e*(2*c^2*d-2*(d*c^2*(c^2*
d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c
^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^...
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*(3*arctan(x*e^(1/2)/sqrt(d))*e^(-5/2)/sqrt(d) - (5*x^3*e + 3*d*x)/(x^4*
e^4 + 2*d*x^2*e^3 + d^2*e^2))*a + b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e + d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e +
 d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4(a+b\operatorname{asin}(cx))}{(d+ex^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(e*x^2 + d)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.647 $\int \frac{x^2(a+b\mathbf{ArcSin}(cx))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=1092

$$\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{a+b\mathrm{ArcSin}(cx)}{16\sqrt{-d}\,e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right.}$$

```
[Out] -1/16*b*c^3*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1
)^(1/2))/e^(3/2)/(c^2*d+e)^(3/2)-1/16*b*c^3*arctanh((c^2*x*(-d)^(1/2)+e^(1/
2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(3/2)/(c^2*d+e)^(3/2)-1/16*(a+b*a
rcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+
e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)-1/16
*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+
(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c
^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/
2)+1/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c
^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(
1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)-1/16*I*b
*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1
/2)))/(-d)^(3/2)/e^(3/2)-1/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(
1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*(-a-b*arcsin
(c*x))/e^(3/2)/(-d)^(1/2)/((-d)^(1/2)-x*e^(1/2))^2+1/16*(-a-b*arcsin(c*x))/
d/e^(3/2)/((-d)^(1/2)-x*e^(1/2))+1/16*(a+b*arcsin(c*x))/e^(3/2)/(-d)^(1/2)/
((-d)^(1/2)+x*e^(1/2))^2+1/16*(a+b*arcsin(c*x))/d/e^(3/2)/((-d)^(1/2)+x*e^(
1/2))+1/16*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^
2+1)^(1/2))/d/e^(3/2)/(c^2*d+e)^(1/2)+1/16*b*c*arctanh((c^2*x*(-d)^(1/2)+e^
(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d/e^(3/2)/(c^2*d+e)^(1/2)+1/16*b
*c*(-c^2*x^2+1)^(1/2)/e/(c^2*d+e)/(-d)^(1/2)/((-d)^(1/2)-x*e^(1/2))+1/16*b*
c*(-c^2*x^2+1)^(1/2)/e/(c^2*d+e)/(-d)^(1/2)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A]

time = 1.83, antiderivative size = 1092, normalized size of antiderivative = 1.00, number of steps used = 62, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.524$, Rules used = {4817, 4757, 4827, 745, 739, 212, 4825, 4617, 2221, 2317, 2438}

[illegible]

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
```

```
) - (a + b*ArcSin[c*x])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)^2) - (a
 + b*ArcSin[c*x])/(16*d*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin[c*x
])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)^2) + (a + b*ArcSin[c*x])/(16
*d*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c^3*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) +
(b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])
])/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - (b*c^3*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*
x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) + (
b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])]
)/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2))
 + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/
2)*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[
2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^
(3/2)*e^(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[2, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*e^
(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
```

```
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^2(a+b\sin^{-1}(cx))}{(d+ex^2)^3}\,dx = \int \left(-\frac{d(a+b\sin^{-1}(cx))}{e\,(d+ex^2)^3}+\frac{a+b\sin^{-1}(cx)}{e\,(d+ex^2)^2}\right)\,dx$$

$$=\frac{\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^2}\,dx}{e}-\frac{d\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^3}\,dx}{e}$$

$$=\frac{\int \left(-\frac{e(a+b\sin^{-1}(cx))}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e(a+b\sin^{-1}(cx))}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e(a+b\sin^{-1}(cx))}{2d(-de-e^2x^2)}\right)\,dx}{e}-\frac{d\int \Bigg(-}{}$$

$$=\frac{3\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{16d}+\frac{3\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{16d}-\frac{\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{4d}-$$

$$=-\frac{a+b\sin^{-1}(cx)}{16\sqrt{-d}\,e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)^2}-\frac{a+b\sin^{-1}(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{a+b\,\mathrm{s}}{16\sqrt{-d}\,e^{3/2}\,(}$$

$$=\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-$$

$$=\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-$$

$$=\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-$$

$$=\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-$$

$$=\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-$$

$$=\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}\,e\,(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-$$

Mathematica [A]
time = 4.25, size = 1014, normalized size = 0.93

[illegible]

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((2*I)*b*c*Sqrt[e]*Sqrt[1 - c^2*x^2])/(Sqrt[d]*(c^2*d + e)*((-I)*Sqrt[d] +
 Sqrt[e]*x)) - ((2*I)*b*c*Sqrt[e]*Sqrt[1 - c^2*x^2])/(Sqrt[d]*(c^2*d + e)*(
I*Sqrt[d] + Sqrt[e]*x)) - (8*a*Sqrt[e]*x)/(d + e*x^2)^2 + (4*a*Sqrt[e]*x)/(
d^2 + d*e*x^2) + ((2*I)*b*ArcSin[c*x])/(Sqrt[d]*(Sqrt[d] - I*Sqrt[e]*x)^2)
- ((2*I)*b*ArcSin[c*x])/(Sqrt[d]*(Sqrt[d] + I*Sqrt[e]*x)^2) + (4*a*ArcTan[(
Sqrt[e]*x)/Sqrt[d]])/d^(3/2) + ((2*I)*b*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x
) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2
])])/Sqrt[c^2*d + e]))/d + (2*b*(ArcSin[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*A
rcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sq
rt[c^2*d + e]))/d - (2*b*c^3*(Log[4] + Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*
c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqr
t[e]*x))]))/(c^2*d + e)^(3/2) - (2*b*c^3*(Log[4] + Log[(e*Sqrt[c^2*d + e]*(
Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I
*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) - (b*(ArcSin[c*x]*(ArcSin[c*x] +
(2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] +
 Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*P
olyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2
*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))
/d^(3/2) + (b*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcS
in[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[
c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin
[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[
c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/d^(3/2))/(32*e^(3/2))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 4.10, size = 2278, normalized size = 2.09

method	result	size
derivativedivides	Expression too large to display	2278
default	Expression too large to display	2278

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-1/16*b*c^4/d/(c^2*d+e)*sum(1/_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x
)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2
))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/16*b*c^4/d/(c^2*d+e)*s
```

um(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2)
)/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2
*d-2*e)*_Z^2+e))+1/8*a*c^3/d/e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/16*b*c
^6/e/(c^2*d+e)*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/16*b*c^6/e/(c^2*d+e)*sum(1/_R1/(-_R1^2*e
+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R
1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
+1/8*a*c^7/(c^2*e*x^2+c^2*d)^2/d*x^3-1/8*a*c^7/(c^2*e*x^2+c^2*d)^2/e*x-1/4*
b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^
2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)^
2/e^2-1/4*b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(
I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))
/(c^2*d+e)^2/e^2+1/8*b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*
arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)
*e)^(1/2))/(c^2*d+e)^2/d/e^2*(d*c^2*(c^2*d+e))^(1/2)-1/4*b*c^4*((2*c^2*d+2*
(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((
2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/(c^2*d+e)/e^3*(d*c^2*(c^2*
d+e))^(1/2)-1/8*b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arct
an(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^
(1/2))/(c^2*d+e)^2/d/e^2*(d*c^2*(c^2*d+e))^(1/2)+1/4*b*c^4*(-e*(2*c^2*d-2*(
d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c
^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e^3*(d*c^2*(c^2*d+e
))^(1/2)+1/4*b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(
e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2
))/e^3/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)+1/4*b*c^6*((2*c^2*d+2*(d*c^2*(c^
2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*
(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)+1/4*b*c^6*(-e*(2*c^2*d-2
*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2
*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)-1/8*b*c^9/e/(c^
2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*d*x+1/8*b*c^7*e/d/(c^2*d+e)/(c^2*e*x
^2+c^2*d)^2*arcsin(c*x)*x^3-1/4*b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2
)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+
e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2)-1/4*b*c^8*((
2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)
^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)^2*d-
1/4*b*c^8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+
(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(
c^2*d+e)^2*d+1/8*b*c^9/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x^3-1/8*b*
c^8/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)*x^2-1/8*b*c^7/(c^2*d+e
)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x-1/8*b*c^8/e*d/(c^2*d+e)/(c^2*e*x^2+c^2*
d)^2*(-c^2*x^2+1)^(1/2)+1/8*b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)
^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(
1/2)+e)*e)^(1/2))/d/(c^2*d+e)/e^2+1/8*b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e)
)^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(

```
c^2*d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*a*(arctan(x*e^(1/2)/sqrt(d))*e^(-3/2)/d^(3/2) + (x^3*e - d*x)/(d*x^4*e^
3 + 2*d^2*x^2*e^2 + d^3*e)) + b*integrate(x^2*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e + d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e +
 d^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2(a + b\operatorname{asin}(cx))}{(d + ex^2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(e*x^2 + d)^3, x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2 (a + b \operatorname{asin}(c x))}{(e x^2 + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
[Out] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.648 $\int \frac{a+b\text{ArcSin}(cx)}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=1092

$$\frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}\,x\right)}-\frac{a+b\text{ArcSin}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right.}$$

```
[Out] 1/16*b*c^3*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)
^(1/2))/d/(c^2*d+e)^(3/2)/e^(1/2)+1/16*b*c^3*arctanh((c^2*x*(-d)^(1/2)+e^(1
/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d/(c^2*d+e)^(3/2)/e^(1/2)+3/16*(a+
b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)+3
/16*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^
(1/2)-3/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)
+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)+3/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)-3/16
*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)
^(1/2)))/(-d)^(5/2)/e^(1/2)+3/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)+1/16*(-a-b*arc
sin(c*x))/(-d)^(3/2)/e^(1/2)/((-d)^(1/2)-x*e^(1/2))^2-3/16*(a+b*arcsin(c*x)
)/d^2/e^(1/2)/((-d)^(1/2)-x*e^(1/2))+1/16*(a+b*arcsin(c*x))/(-d)^(3/2)/e^(1
/2)/((-d)^(1/2)+x*e^(1/2))^2+3/16*(a+b*arcsin(c*x))/d^2/e^(1/2)/((-d)^(1/2)
+x*e^(1/2))+3/16*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-
c^2*x^2+1)^(1/2))/d^2/e^(1/2)/(c^2*d+e)^(1/2)+3/16*b*c*arctanh((c^2*x*(-d)^
(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d^2/e^(1/2)/(c^2*d+e)^(1
/2)+1/16*b*c*(-c^2*x^2+1)^(1/2)/(-d)^(3/2)/(c^2*d+e)/((-d)^(1/2)-x*e^(1/2))
+1/16*b*c*(-c^2*x^2+1)^(1/2)/(-d)^(3/2)/(c^2*d+e)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A]
time = 0.88, antiderivative size = 1092, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 10, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4757, 4827, 745, 739, 212, 4825, 4617, 2221, 2317, 2438}

[illegible]

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
```

```
) - (a + b*ArcSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)^2) -
(3*(a + b*ArcSin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*Ar
cSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)^2) + (3*(a + b*Arc
Sin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*ArcTanh[(Sqrt[e
] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e]*(c^
2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e
]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (b*c^3*ArcTanh[(S
qrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e
]*(c^2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*
d + e]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (3*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e])
 + (3*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[
1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^3}\,dx = \int \left(-\frac{e^{3/2}(a+b\sin^{-1}(cx))}{8(-d)^{3/2}\left(\sqrt{-d}\,\sqrt{e}-ex\right)^3} - \frac{3e(a+b\sin^{-1}(cx))}{16d^2\left(\sqrt{-d}\,\sqrt{e}-ex\right)^2} - \frac{e^{3/2}(a+b\sin\ldots}{8(-d)^{3/2}\left(\sqrt{-d}\ldots\right.}\right.$$

$$= -\frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\,\sqrt{e}-ex\right)^2}\,dx}{16d^2} - \frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{\left(\sqrt{-d}\,\sqrt{e}+ex\right)^2}\,dx}{16d^2} - \frac{(3e)\int \frac{a+b\sin^{-1}(cx)}{-de-e^2x^2}\,dx}{8d^2} \ldots$$

$$= -\frac{a+b\sin^{-1}(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)^2} - \frac{3(a+b\sin^{-1}(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{a+b\,\mathrm{s}\ldots}{16(-d)^{3/2}\sqrt{e}\ldots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \ldots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \ldots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \ldots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \ldots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \ldots$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}\,x\right)} - \ldots$$

Mathematica [A]
time = 4.16, size = 1033, normalized size = 0.95

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^3,x]

[Out] ((8*a*d^(3/2)*x)/(d + e*x^2)^2 + (12*a*Sqrt[d]*x)/(d + e*x^2) + (12*a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[e] + ((6*I)*b*Sqrt[d]*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]))/Sqrt[e] - (6*b*Sqrt[d]*(-(ArcSin[c*x]/(I*Sqrt[d] + Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]))/Sqrt[e] + (2*I)*b*d*(-((c*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x))) - ArcSin[c*x]/(Sqrt[e]*((-I)*Sqrt[d] + Sqrt[e]*x)^2) - (I*c^3*Sqrt[d]*(Log[4] + Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3/2))) + 2*b*d*((I*c*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x)) + (I*ArcSin[c*x])/(Sqrt[e]*(I*Sqrt[d] + Sqrt[e]*x)^2) + (c^3*Sqrt[d]*(Log[4] + Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3/2))) - (3*b*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))/Sqrt[e] + (3*b*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/Sqrt[e])/(32*d^(5/2))

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 1.90, size = 3127, normalized size = 2.86

method	result	size
derivativedivides	Expression too large to display	3127
default	Expression too large to display	3127

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)

[Out] 1/c*(-3/16*b*c^2/d^2/(c^2*d+e)*e*sum(1/_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+3/8*b*c^2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d^2/(c^2*d+e)^2/e*(d*c^2*(c^2*d+e))^(1/2)-3/4*b*c^2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arc

tanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)
^(1/2))/d^2/(c^2*d+e)/e^2*(d*c^2*(c^2*d+e))^(1/2)-3/8*b*c^2*(-e*(2*c^2*d-2*
(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*
c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d^2/(c^2*d+e)^2/e*(d*c^2*(c^2*
d+e))^(1/2)+3/4*b*c^2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arct
an(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^
(1/2))/d^2/(c^2*d+e)/e^2*(d*c^2*(c^2*d+e))^(1/2)-3/16*b*c^2/d^2/(c^2*d+e)*e
*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/
2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c
^2*d-2*e)*_Z^2+e))+1/4*a*c^5*x/d/(c^2*e*x^2+c^2*d)^2+3/8*a*c^3/d^2*x/(c^2*e
*x^2+c^2*d)-3/16*b*c^4/d/(c^2*d+e)*sum(1/_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin
(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^
(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3/16*b*c^4/d/(c^2*d+
e)*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(
1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4
*c^2*d-2*e)*_Z^2+e))-7/4*b*c^6*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1
/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2
)+e)*e)^(1/2))/(c^2*d+e)^2/e^2-7/4*b*c^6*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(
1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2
*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)^2/e^2+5/8*b*c^5/d/(c^2*d+e)/(c^2*e*x^2+
c^2*d)^2*arcsin(c*x)*e*x+3/8*b*c^5/d^2/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin
(c*x)*e^2*x^3+1/8*b*c^6/d/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)*
e*x^2+5/4*b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(
I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/
(c^2*d+e)^2/d/e^2*(d*c^2*(c^2*d+e))^(1/2)-b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e
))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^
2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/(c^2*d+e)/e^3*(d*c^2*(c^2*d+e))^(1/2)-5/4
*b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c
^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e
)^2/d/e^2*(d*c^2*(c^2*d+e))^(1/2)+b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1
/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*
d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e^3*(d*c^2*(c^2*d+e))^(1/2)+b*c^6*((2*
c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(
1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)^2*(d*c
^2*(c^2*d+e))^(1/2)+3/8*a*c/d^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/8*b*c
^6/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*(-c^2*x^2+1)^(1/2)+b*c^6*((2*c^2*d+2*(d*c^
2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2
d+2(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2*d+e)+b*c^6*(-e*(2*c^2*d-
2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-
2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)+3/8*b*c^7*e/d/
(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x^3-b*c^6*(-e*(2*c^2*d-2*(d*c^2*(
c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*
(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^3/(c^2*d+e)^2*(d*c^2*(c^2*d+e))^(1/2
)-b*c^8*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-
c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^3/(c^2

```
*d+e)^2*d-b*c^8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e*(
I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))
/e^3/(c^2*d+e)^2*d+5/8*b*c^7/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)*x+5/
4*b*c^4*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-
c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/(c^2*d
+e)/e^2+5/4*b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*arctan(e
*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2
))/d/(c^2*d+e)/e^2+3/8*b*c^2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2
)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+
e)*e)^(1/2))/d^2/(c^2*d+e)/e-3/4*b*c^4*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/
2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d
+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)^2/e+3/8*b*c^2*(-e*(2*c^2*d-2*(d*c^2*(c^
2*d+e))^(1/2)+e))^(1/2)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d
*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d^2/(c^2*d+e)/e-3/4*b*c^4*((2*c^2*d+2*(d
*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*
c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d/...
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*a*((3*x^3*e + 5*d*x)/(d^2*x^4*e^2 + 2*d^3*x^2*e + d^4) + 3*arctan(x*e^(
1/2)/sqrt(d))*e^(-1/2)/d^(5/2)) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e + d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e + d^3), x
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}{\left(cx \right)}}{\left(d + ex^{2}\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(e\,x^2+d\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2)^3, x)
```

3.649 $\int \sqrt{d+ex^2}\,(a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx)),x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] Defer[Int][Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \sqrt{d+ex^2}\,\left(a+b\sin^{-1}(cx)\right)\,dx=\int \sqrt{d+ex^2}\,\left(a+b\sin^{-1}(cx)\right)\,dx$$

Mathematica [A]
time = 3.77, size = 0, normalized size = 0.00

$$\int \sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]), x]
```

Maple [A]
time = 1.32, size = 0, normalized size = 0.00

$$\int \sqrt{e\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/2*(d*arcsinh(x*e^(1/2)/sqrt(d))*e^(-1/2) + sqrt(x^2*e + d)*x)*a + b*integ
rate(sqrt(x^2*e + d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^2*e + d)*(b*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b \operatorname{asin}(cx)) \sqrt{d + ex^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral((a + b*asin(c*x))*sqrt(d + e*x**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int (a + b\,\mathrm{asin}(c\,x))\,\sqrt{e\,x^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))*(d + e*x^2)^(1/2), x)
```

3.650 $\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{a+b\text{ArcSin}(cx)}{\sqrt{d+ex^2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
```

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+ex^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2],x]
[Out] Defer[Int][(a + b*ArcSin[c*x])/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}}\,dx=\int \frac{a+b\sin^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$$

Mathematica [A]
time = 3.09, size = 0, normalized size = 0.00

$$\int \frac{a+b\text{ArcSin}(cx)}{\sqrt{d+ex^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2],x]
[Out] Integrate[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2], x]
```

Maple [A]
time = 0.96, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin(cx)}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] a*arcsinh(x*e^(1/2)/sqrt(d))*e^(-1/2) + b*integrate(arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))/sqrt(x^2*e + d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/sqrt(x^2*e + d), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{asin}(cx)}{\sqrt{d + ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))/sqrt(d + e*x**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/sqrt(e*x^2 + d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))/(d + e*x^2)^(1/2), x)
```

3.651 $\int \frac{a+b\mathbf{ArcSin}(cx)}{(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=70

$$\frac{x(a+b\text{ArcSin}(cx))}{d\sqrt{d+ex^2}}+\frac{b\text{ArcTan}\left(\frac{\sqrt{e}\,\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

```
[Out] b*arctan(e^(1/2)*(-c^2*x^2+1)^(1/2)/c/(e*x^2+d)^(1/2))/d/e^(1/2)+x*(a+b*arc
sin(c*x))/d/(e*x^2+d)^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {197, 4755, 12, 455, 65, 223, 209}

$$\frac{x(a+b\text{ArcSin}(cx))}{d\sqrt{d+ex^2}}+\frac{b\text{ArcTan}\left(\frac{\sqrt{e}\,\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d + e*x^2]) + (b*ArcTan[(Sqrt[e]*Sqrt[1 - c
^2*x^2])/(c*Sqrt[d + e*x^2])])/(d*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^{3/2}}\,dx &= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d+ex^2}} - (bc)\int \frac{x}{d\sqrt{1-c^2x^2}\sqrt{d+ex^2}}\,dx \\
&= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d+ex^2}} - \frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{d+ex^2}}\,dx}{d} \\
&= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d+ex^2}} - \frac{(bc)\mathrm{Subst}\left(\int \frac{1}{\sqrt{1-c^2x}\sqrt{d+ex}}\,dx, x, x^2\right)}{2d} \\
&= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d+ex^2}} + \frac{b\mathrm{Subst}\left(\int \frac{1}{\sqrt{d+\frac{e}{c^2}-\frac{ex^2}{c^2}}}\,dx, x, \sqrt{1-c^2x^2}\right)}{cd} \\
&= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d+ex^2}} + \frac{b\mathrm{Subst}\left(\int \frac{1}{1+\frac{ex^2}{c^2}}\,dx, x, \frac{\sqrt{1-c^2x^2}}{\sqrt{d+ex^2}}\right)}{cd} \\
&= \frac{x(a+b\sin^{-1}(cx))}{d\sqrt{d+ex^2}} + \frac{b\tan^{-1}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}
\end{aligned}
$$

Mathematica [C] Result contains higher order function than in optimal. Order 6 vs. order 3 in optimal.
time = 0.07, size = 74, normalized size = 1.06

$$
\frac{x\left(-bcx\sqrt{1+\frac{ex^2}{d}}\,F_1\left(1;\frac{1}{2},\frac{1}{2};2;c^2x^2,-\frac{ex^2}{d}\right)+2(a+b\mathrm{ArcSin}(cx))\right)}{2d\sqrt{d+ex^2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(3/2),x]
```

```
[Out] (x*(-(b*c*x*Sqrt[1 + (e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2)
/d)]) + 2*(a + b*ArcSin[c*x])))/(2*d*Sqrt[d + e*x^2])
```

Maple [F]
time = 0.82, size = 0, normalized size = 0.00

$$
\int \frac{a+b\arcsin(cx)}{(e\,x^2+d)^{\frac{3}{2}}}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c^2*d-%e>0)', see `assume?` for mor
e detai
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 142 vs. $2(60) = 120$.
time = 2.18, size = 142, normalized size = 2.03

$$\frac{(bx^2e+bd)\arctan\left(\frac{\sqrt{-c^2x^2+1}\,(c^2d+(2\,c^2x^2-1)e)\,\sqrt{x^2e+d}\,e^{\frac{1}{2}}}{2\,((c^3x^4-cx^2)e^2+(c^3dx^2-cd)e)}\right)e^{\frac{1}{2}}+2\,(bx\arcsin{(cx)}\,e+axe)\sqrt{x^2e+d}}{2\,(dx^2e^2+d^2e)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*((b*x^2*e + b*d)*arctan(1/2*sqrt(-c^2*x^2 + 1)*(c^2*d + (2*c^2*x^2 - 1)
*e)*sqrt(x^2*e + d)*e^(1/2)/((c^3*x^4 - c*x^2)*e^2 + (c^3*d*x^2 - c*d)*e))*
e^(1/2) + 2*(b*x*arcsin(c*x)*e + a*x*e)*sqrt(x^2*e + d))/(d*x^2*e^2 + d^2*e
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\operatorname{asin}{(cx)}}{(d+ex^2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2)^(3/2), x)
```

3.652 $\int \frac{a+b\textbf{ArcSin}(cx)}{(d+ex^2)^{5/2}} dx$

Optimal. Leaf size=146

$$\frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\,\sqrt{d+ex^2}}+\frac{x(a+b\text{ArcSin}(cx))}{3d\,(d+ex^2)^{3/2}}+\frac{2x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d+ex^2}}+\frac{2b\text{ArcTan}\left(\frac{\sqrt{e}\,\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}$$

```
[Out] 1/3*x*(a+b*arcsin(c*x))/d/(e*x^2+d)^(3/2)+2/3*b*arctan(e^(1/2)*(-c^2*x^2+1)
^(1/2)/c/(e*x^2+d)^(1/2))/d^2/e^(1/2)+2/3*x*(a+b*arcsin(c*x))/d^2/(e*x^2+d)
^(1/2)+1/3*b*c*(-c^2*x^2+1)^(1/2)/d/(c^2*d+e)/(e*x^2+d)^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {198, 197, 4755, 12, 585, 79, 65, 223, 209}

$$\frac{2x(a+b\text{ArcSin}(cx))}{3d^2\sqrt{d+ex^2}}+\frac{x(a+b\text{ArcSin}(cx))}{3d\,(d+ex^2)^{3/2}}+\frac{2b\text{ArcTan}\left(\frac{\sqrt{e}\,\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}+\frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\,\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(3*d*(c^2*d + e)*Sqrt[d + e*x^2]) + (x*(a + b*ArcSi
n[c*x]))/(3*d*(d + e*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d
+ e*x^2]) + (2*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(
3*d^2*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
```

```
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 585

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx = \frac{x(a+b\sin^{-1}(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - (bc)\int \frac{x(3d+2ex^2)}{3d^2\sqrt{1-c^2x^2}\,(d+ex^2)^{3/2}}\,dx$$

$$= \frac{x(a+b\sin^{-1}(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - \frac{(bc)\int \frac{x(3d+2ex^2)}{\sqrt{1-c^2x^2}\,(d+ex^2)^{3/2}}\,dx}{3d^2}$$

$$= \frac{x(a+b\sin^{-1}(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - \frac{(bc)\text{Subst}\left(\int \frac{3d+2ex}{\sqrt{1-c^2x}\,(d+ex)^{3/2}}\,dx, x, \ldots\right)}{6d^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} - \frac{(bc)\text{Subst}\left(\int \ldots\right.}{\ldots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} + \frac{(2b)\text{Subst}\left(\ldots\right.}{\ldots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} + \frac{(2b)\text{Subst}\left(\int \ldots\right.}{\ldots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\sin^{-1}(cx))}{3d^2\sqrt{d+ex^2}} + \frac{2b\tan^{-1}\left(\sqrt{\ldots}\right.}{3d\ldots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 6 vs. order 3 in optimal.
time = 0.16, size = 190, normalized size = 1.30

$$\frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\sqrt{d+ex^2}} + \sqrt{d+ex^2}\left(\frac{ax}{3d\,(d+ex^2)^2} + \frac{2ax}{3d^2\,(d+ex^2)}\right) - \frac{bcx^2\sqrt{\frac{d+ex^2}{d}}\,F_1\left(1;\frac{1}{2},\frac{1}{2};2;c^2x^2,-\frac{ex^2}{d}\right)}{3d^2\sqrt{d+ex^2}} + \frac{bx(3d+2ex^2)\,\text{ArcSin}(cx)}{3d^2\,(d+ex^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(3*d*(c^2*d + e)*Sqrt[d + e*x^2]) + Sqrt[d + e*x^2]
*((a*x)/(3*d*(d + e*x^2)^2) + (2*a*x)/(3*d^2*(d + e*x^2))) - (b*c*x^2*Sqrt[
(d + e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2)/d)])/(3*d^2*Sqrt
[d + e*x^2]) + (b*x*(3*d + 2*e*x^2)*ArcSin[c*x])/(3*d^2*(d + e*x^2)^(3/2))
```

Maple [F]
time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin\left(c x\right)}{\left(e\,x^{2}+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(2*x/(sqrt(x^2*e + d)*d^2) + x/((x^2*e + d)^(3/2)*d)) + b*integrate(a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((x^4*e^2 + 2*d*x^2*e + d^2)*sqrt
(x^2*e + d)), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 333 vs. 2(125) = 250.
time = 1.72, size = 333, normalized size = 2.28

$$\frac{(bc^2d^3+bx^4e^3+(bc^2dx^4+2\,bdx^2)e^2+(2\,bc^2d^2x^2+bd^2)e)\arctan\left(\frac{\sqrt{-c^2x^2+1}\,(c^2d+(2\,c^2x^2-1)e)\sqrt{x^2e+d}\,e^{\frac{1}{2}}}{2\,((c^3x^4-cx^2)e^2+(c^3dx^2-cd)e)}\right)e^{\frac{1}{2}}+\left(3\,ac^2d^2xe+2\,ax^3e^3+(3\,bc^2d^2xe+2\,bx^3e^3+(2\,bc^2dx^3+3\,bdx)e^2)\arcsin\left(cx\right)+(2\,ac^2dx^3+3\,adx)e^2+(bcdx^2e^2+bcd^2e)\sqrt{-c^2x^2+1}\right)\sqrt{x^2e+d}}{3\,(c^2d^5e+d^2x^4e^4+(c^2d^3x^4+2\,d^3x^2)e^3+(2\,c^2d^4x^2+d^4)e^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*((b*c^2*d^3 + b*x^4*e^3 + (b*c^2*d*x^4 + 2*b*d*x^2)*e^2 + (2*b*c^2*d^2*
x^2 + b*d^2)*e)*arctan(1/2*sqrt(-c^2*x^2 + 1)*(c^2*d + (2*c^2*x^2 - 1)*e)*s
qrt(x^2*e + d)*e^(1/2)/((c^3*x^4 - c*x^2)*e^2 + (c^3*d*x^2 - c*d)*e))*e^(1/
2) + (3*a*c^2*d^2*x*e + 2*a*x^3*e^3 + (3*b*c^2*d^2*x*e + 2*b*x^3*e^3 + (2*b
*c^2*d*x^3 + 3*b*d*x)*e^2)*arcsin(c*x) + (2*a*c^2*d*x^3 + 3*a*d*x)*e^2 + (b
*c*d*x^2*e^2 + b*c*d^2*e)*sqrt(-c^2*x^2 + 1))*sqrt(x^2*e + d))/(c^2*d^5*e +
 d^2*x^4*e^4 + (c^2*d^3*x^4 + 2*d^3*x^2)*e^3 + (2*c^2*d^4*x^2 + d^4)*e^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\operatorname{asin}\left(cx\right)}{\left(d+ex^{2}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**(5/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(5/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\mathrm{asin}(c\,x)}{{(e\,x^2 + d)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2)^(5/2), x)
```

3.653 $\int \frac{a+b\mathbf{ArcSin}(cx)}{(d+ex^2)^{7/2}}\,dx$

Optimal. Leaf size=226

$$\frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}}+\frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}}+\frac{x(a+b\text{ArcSin}(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\text{ArcSin}(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+}{15d^3}$$

```
[Out] 1/5*x*(a+b*arcsin(c*x))/d/(e*x^2+d)^(5/2)+4/15*x*(a+b*arcsin(c*x))/d^2/(e*x
^2+d)^(3/2)+8/15*b*arctan(e^(1/2)*(-c^2*x^2+1)^(1/2)/c/(e*x^2+d)^(1/2))/d^3
/e^(1/2)+1/15*b*c*(-c^2*x^2+1)^(1/2)/d/(c^2*d+e)/(e*x^2+d)^(3/2)+8/15*x*(a+
b*arcsin(c*x))/d^3/(e*x^2+d)^(1/2)+2/15*b*c*(3*c^2*d+2*e)*(-c^2*x^2+1)^(1/2
)/d^2/(c^2*d+e)^2/(e*x^2+d)^(1/2)
```

Rubi [A]
time = 0.58, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {198, 197, 4755, 12, 6847, 963, 79, 65, 223, 209}

$$\frac{8x(a+b\text{ArcSin}(cx))}{15d^3\sqrt{d+ex^2}}+\frac{4x(a+b\text{ArcSin}(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{x(a+b\text{ArcSin}(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{8b\text{ArcTan}\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{15d^3\sqrt{e}}+\frac{2bc\sqrt{1-c^2x^2}\left(3c^2d+2e\right)}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}}+\frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(7/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(15*d*(c^2*d + e)*(d + e*x^2)^(3/2)) + (2*b*c*(3*c^
2*d + 2*e)*Sqrt[1 - c^2*x^2])/(15*d^2*(c^2*d + e)^2*Sqrt[d + e*x^2]) + (x*(
a + b*ArcSin[c*x]))/(5*d*(d + e*x^2)^(5/2)) + (4*x*(a + b*ArcSin[c*x]))/(15
*d^2*(d + e*x^2)^(3/2)) + (8*x*(a + b*ArcSin[c*x]))/(15*d^3*Sqrt[d + e*x^2]
) + (8*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(15*d^3*S
qrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 963

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x
 + c*x^2)^p, d + e*x, x], R = PolynomialRemainder[(a + b*x + c*x^2)^p, d +
e*x, x]}, Simp[R*(d + e*x)^(m + 1)*((f + g*x)^(n + 1)/((m + 1)*(e*f - d*g))
), x] + Dist[1/((m + 1)*(e*f - d*g)), Int[(d + e*x)^(m + 1)*(f + g*x)^n*Exp
andToSum[(m + 1)*(e*f - d*g)*Qx - g*R*(m + n + 2), x], x], x]] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c
*d^2 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int \frac{a+b\sin^{-1}(cx)}{(d+ex^2)^{7/2}}\,dx = \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(a+b\sin^{-1}(cx))}{15d^2\,(d+ex^2)^{3/2}} + \frac{8x(a+b\sin^{-1}(cx))}{15d^3\sqrt{d+ex^2}} - (bc)\int \frac{x(15d^2+\cdots}{15d^3\sqrt{1-\cdots}}$$

$$= \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(a+b\sin^{-1}(cx))}{15d^2\,(d+ex^2)^{3/2}} + \frac{8x(a+b\sin^{-1}(cx))}{15d^3\sqrt{d+ex^2}} - \frac{(bc)\int \frac{x(15d^2+20de\cdots}{\sqrt{1-c^2x^2}\cdots}}{15d^3\cdots}$$

$$= \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(a+b\sin^{-1}(cx))}{15d^2\,(d+ex^2)^{3/2}} + \frac{8x(a+b\sin^{-1}(cx))}{15d^3\sqrt{d+ex^2}} - \frac{(bc)\text{Subst}\left(\int \frac{15\cdots}{\sqrt{1\cdots}}\cdots\right.}{\cdots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\,(c^2d+e)\,(d+ex^2)^{3/2}} + \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(a+b\sin^{-1}(cx))}{15d^2\,(d+ex^2)^{3/2}} + \frac{8x(a+b\sin\cdots}{15d^3\sqrt{d-\cdots}}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\,(c^2d+e)\,(d+ex^2)^{3/2}} + \frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\,(c^2d+e)^2\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(\cdots}{15\cdots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\,(c^2d+e)\,(d+ex^2)^{3/2}} + \frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\,(c^2d+e)^2\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(\cdots}{15\cdots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\,(c^2d+e)\,(d+ex^2)^{3/2}} + \frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\,(c^2d+e)^2\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(\cdots}{15\cdots}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\,(c^2d+e)\,(d+ex^2)^{3/2}} + \frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\,(c^2d+e)^2\sqrt{d+ex^2}} + \frac{x(a+b\sin^{-1}(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(\cdots}{15\cdots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 6 vs. order 3 in optimal.
time = 0.27, size = 188, normalized size = 0.83

$$\frac{ax(15d^2+20dex^2+8e^2x^4)+\frac{bcd\sqrt{1-c^2x^2}(d+ex^2)(e(5d+4ex^2)+c^2d(7d+6ex^2))}{(c^2d+e)^2}-4bcx^2(d+ex^2)^2\sqrt{1+\frac{ex^2}{d}}\,F_1\left(1;\frac{1}{2},\frac{1}{2};2;c^2x^2,-\frac{ex^2}{d}\right)+bx(15d^2+20dex^2+8e^2x^4)\,\text{ArcSin}(cx)}{15d^3(d+ex^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(7/2),x]
```

```
[Out] (a*x*(15*d^2 + 20*d*e*x^2 + 8*e^2*x^4) + (b*c*d*Sqrt[1 - c^2*x^2]*(d + e*x^
2)*(e*(5*d + 4*e*x^2) + c^2*d*(7*d + 6*e*x^2)))/(c^2*d + e)^2 - 4*b*c*x^2*(
d + e*x^2)^2*Sqrt[1 + (e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2
)/d)] + b*x*(15*d^2 + 20*d*e*x^2 + 8*e^2*x^4)*ArcSin[c*x])/(15*d^3*(d + e*x
^2)^(5/2))
```

Maple [F]
time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{a+b\arcsin(cx)}{(e\,x^2+d)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="maxima")
```

```
[Out] 1/15*a*(8*x/(sqrt(x^2*e + d)*d^3) + 4*x/((x^2*e + d)^(3/2)*d^2) + 3*x/((x^2
*e + d)^(5/2)*d)) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/
((x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e + d^3)*sqrt(x^2*e + d)), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 660 vs. 2(199) = 398.
time = 3.09, size = 660, normalized size = 2.92

$$\frac{4\,(bc^4d^5+bx^6e^5+(2\,bc^2dx^6+3\,bdx^4)e^4+(bc^4d^2x^6+6\,bc^2d^2x^4+3\,bd^2x^2)e^3+(3\,bc^4d^3x^4+6\,bc^2d^3x^2+bd^3)e^2+(3\,bc^4d^4x^2+2\,bc^2d^4)e)\arctan\left(\frac{\sqrt{-c^2x^2+1}\,(c^2d+(2c^2x^2-1)e)\sqrt{x^2e+d}\,e^{\frac{1}{2}}}{2((c^2x^4-cx^2)e^2+(c^2dx^2-cd)e)}\right)e^{\frac{1}{2}}+\left(15\,ac^4d^4xe+8\,ax^5e^5+(15\,bc^4d^4xe+8\,bx^5e^5+4\,(4\,bc^2dx^5+5\,bdx^3)e^4+(8\,bc^4d^2x^5+40\,bc^2d^2x^3+15\,bd^2x)e^3+10\,(2\,bc^4d^3x^3+3\,bc^2d^3x)e^2)\arcsin(cx)+4\,(4\,ac^2dx^5+5\,adx^3)e^4+(8\,ac^4d^2x^5+40\,ac^2d^2x^3+15\,ad^2x)e^3+10\,(2\,ac^4d^3x^3+3\,ac^2d^3x)e^2+(7\,bc^3d^4e+4\,bcdx^4e^4+3\,(2\,bc^3d^2x^4+3\,bcd^2x^2)e^3+(13\,bc^3d^3x^2+5\,bcd^3)e^2)\sqrt{-c^2x^2+1}\right)\sqrt{x^2e+d}}{15\,(c^4d^8e+d^3x^6e^6+(2\,c^2d^4x^6+3\,d^4x^4)e^5+(c^4d^5x^6+6\,c^2d^5x^4+3\,d^5x^2)e^4+(3\,c^4d^6x^4+6\,c^2d^6x^2+d^6)e^3+(3\,c^4d^7x^2+2\,c^2d^7)e^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(4*(b*c^4*d^5 + b*x^6*e^5 + (2*b*c^2*d*x^6 + 3*b*d*x^4)*e^4 + (b*c^4*d
^2*x^6 + 6*b*c^2*d^2*x^4 + 3*b*d^2*x^2)*e^3 + (3*b*c^4*d^3*x^4 + 6*b*c^2*d^
3*x^2 + b*d^3)*e^2 + (3*b*c^4*d^4*x^2 + 2*b*c^2*d^4)*e)*arctan(1/2*sqrt(-c^
2*x^2 + 1)*(c^2*d + (2*c^2*x^2 - 1)*e)*sqrt(x^2*e + d)*e^(1/2)/((c^3*x^4 -
c*x^2)*e^2 + (c^3*d*x^2 - c*d)*e))*e^(1/2) + (15*a*c^4*d^4*x*e + 8*a*x^5*e^
5 + (15*b*c^4*d^4*x*e + 8*b*x^5*e^5 + 4*(4*b*c^2*d*x^5 + 5*b*d*x^3)*e^4 + (
8*b*c^4*d^2*x^5 + 40*b*c^2*d^2*x^3 + 15*b*d^2*x)*e^3 + 10*(2*b*c^4*d^3*x^3
+ 3*b*c^2*d^3*x)*e^2)*arcsin(c*x) + 4*(4*a*c^2*d*x^5 + 5*a*d*x^3)*e^4 + (8*
a*c^4*d^2*x^5 + 40*a*c^2*d^2*x^3 + 15*a*d^2*x)*e^3 + 10*(2*a*c^4*d^3*x^3 +
3*a*c^2*d^3*x)*e^2 + (7*b*c^3*d^4*e + 4*b*c*d*x^4*e^4 + 3*(2*b*c^3*d^2*x^4
+ 3*b*c*d^2*x^2)*e^3 + (13*b*c^3*d^3*x^2 + 5*b*c*d^3)*e^2)*sqrt(-c^2*x^2 +
1))*sqrt(x^2*e + d))/(c^4*d^8*e + d^3*x^6*e^6 + (2*c^2*d^4*x^6 + 3*d^4*x^4)
*e^5 + (c^4*d^5*x^6 + 6*c^2*d^5*x^4 + 3*d^5*x^2)*e^4 + (3*c^4*d^6*x^4 + 6*c
^2*d^6*x^2 + d^6)*e^3 + (3*c^4*d^7*x^2 + 2*c^2*d^7)*e^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(7/2),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(7/2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{{\left(e\,x^2+d\right)}^{7/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^(7/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2)^(7/2), x)
```

3.654 $\int (fx)^m \left(d+ex^2\right)^3 (a+b\mathbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=484

$$\frac{be\left(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2\left(35+12m+m^2\right)^2+e^2\left(360+342m+119m^2+18m^3+m^4\right)\right)(}{c^5f^2(3+m)^2(5+m)^2(7+m)^2}$$

```
[Out] d^3*(f*x)^(1+m)*(a+b*arcsin(c*x))/f/(1+m)+3*d^2*e*(f*x)^(3+m)*(a+b*arcsin(c
*x))/f^3/(3+m)+3*d*e^2*(f*x)^(5+m)*(a+b*arcsin(c*x))/f^5/(5+m)+e^3*(f*x)^(7
+m)*(a+b*arcsin(c*x))/f^7/(7+m)-b*(c^6*d^3*(3+m)*(5+m)*(7+m)/(1+m)+e*(2+m)*
(3*c^2*d*e*(7+m)^2*(m^2+7*m+12)+3*c^4*d^2*(m^2+12*m+35)^2+e^2*(m^4+18*m^3+1
19*m^2+342*m+360))/(m^3+15*m^2+71*m+105))*(f*x)^(2+m)*hypergeom([1/2, 1+1/2
*m],[2+1/2*m],c^2*x^2)/c^5/f^2/(2+m)/(3+m)/(5+m)/(7+m)+b*e*(3*c^2*d*e*(7+m)
^2*(m^2+7*m+12)+3*c^4*d^2*(m^2+12*m+35)^2+e^2*(m^4+18*m^3+119*m^2+342*m+360
))*(f*x)^(2+m)*(-c^2*x^2+1)^(1/2)/c^5/f^2/(3+m)^2/(5+m)^2/(7+m)^2+b*e^2*(3*
c^2*d*(7+m)^2+e*(m^2+11*m+30))*(f*x)^(4+m)*(-c^2*x^2+1)^(1/2)/c^3/f^4/(5+m)
^2/(7+m)^2+b*e^3*(f*x)^(6+m)*(-c^2*x^2+1)^(1/2)/c/f^6/(7+m)^2
```

Rubi [A]
time = 1.60, antiderivative size = 455, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = $\{276, 4815, 12, 1823, 1281, 470, 371\}$

$$\frac{d^3(fx)^{m+1}(a+b\text{ArcSin}(cx))}{f(m+1)}+\frac{3d^2e(fx)^{m+3}(a+b\text{ArcSin}(cx))}{f^3(m+3)}+\frac{3de^2(fx)^{m+5}(a+b\text{ArcSin}(cx))}{f^5(m+5)}+\frac{e^3(fx)^{m+7}(a+b\text{ArcSin}(cx))}{f^7(m+7)}+\frac{be^3\sqrt{1-c^2x^2}(fx)^{m+6}}{cf^6(m+7)^2}+\frac{be^2\sqrt{1-c^2x^2}(fx)^{m+4}\left(3c^2d(m+7)^2+e\left(m^2+11m+30\right)\right)}{c^3f^4(m+5)^2(m+7)^2}-\frac{bc(fx)^{m+2}\left(\frac{e\left(3c^4d^2\left(m^2+12m+35\right)^2+3c^2de(m+7)^2\left(m^2+7m+12\right)+e^2\left(m^4+18m^3+119m^2+342m+360\right)\right)}{c^6(m+3)^2(m+5)^2(m+7)^2}+\frac{d^3}{m^2+3m+2}\right){}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{f^2}+\frac{be\sqrt{1-c^2x^2}(fx)^{m+2}\left(3c^4d^2\left(m^2+12m+35\right)^2+3c^2de(m+7)^2\left(m^2+7m+12\right)+e^2\left(m^4+18m^3+119m^2+342m+360\right)\right)}{c^5f^2(m+3)^2(m+5)^2(m+7)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(3*c^2*d*e*(7 + m)^2*(12 + 7*m + m^2) + 3*c^4*d^2*(35 + 12*m + m^2)^2
+ e^2*(360 + 342*m + 119*m^2 + 18*m^3 + m^4))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^5*f^2*(3 + m)^2*(5 + m)^2*(7 + m)^2) + (b*e^2*(3*c^2*d*(7 + m)^2 + e
*(30 + 11*m + m^2))*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])/(c^3*f^4*(5 + m)^2*(7
+ m)^2) + (b*e^3*(f*x)^(6 + m)*Sqrt[1 - c^2*x^2])/(c*f^6*(7 + m)^2) + (d^3*
(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) + (3*d^2*e*(f*x)^(3 + m)*(a
+ b*ArcSin[c*x]))/(f^3*(3 + m)) + (3*d*e^2*(f*x)^(5 + m)*(a + b*ArcSin[c*x]
))/(f^5*(5 + m)) + (e^3*(f*x)^(7 + m)*(a + b*ArcSin[c*x]))/(f^7*(7 + m)) -
(b*c*(d^3/(2 + 3*m + m^2) + (e*(3*c^2*d*e*(7 + m)^2*(12 + 7*m + m^2) + 3*c^
4*d^2*(35 + 12*m + m^2)^2 + e^2*(360 + 342*m + 119*m^2 + 18*m^3 + m^4)))/(c
^6*(3 + m)^2*(5 + m)^2*(7 + m)^2))*(f*x)^(2 + m)*Hypergeometric2F1[1/2, (2
+ m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
```

```
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right)\,dx = \frac{d^3(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{3d^2e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} +$$

$$= \frac{d^3(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{3d^2e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} +$$

$$= \frac{be^3(fx)^{6+m}\sqrt{1-c^2x^2}}{cf^6(7+m)^2} + \frac{d^3(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{3d^2e(}{}$$

$$= \frac{be^2\left(3c^2d(7+m)^2+e(30+11m+m^2)\right)(fx)^{4+m}\sqrt{1-c^2x^2}}{c^3f^4(5+m)^2(7+m)^2} +$$

$$= \frac{be\Big(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2(35+12m+m^2)^2 +}{c^5f^2(3+m)^2(5}$$

$$= \frac{be\Big(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2(35+12m+m^2)^2 +}{c^5f^2(3+m)^2(5}$$

Mathematica [F]
time = 5.19, size = 0, normalized size = 0.00

$$\int (fx)^m \left(d+ex^2\right)^3 (a+b\text{ArcSin}(cx))\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
[Out] Integrate[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]), x]
```

Maple [F]
time = 18.97, size = 0, normalized size = 0.00

$$\int (fx)^m \left(e\,x^2+d\right)^3 (a+b\arcsin(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] int((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] a*f^m*x^7*e^(m*log(x) + 3)/(m + 7) + 3*a*d*f^m*x^5*e^(m*log(x) + 2)/(m + 5)
 + 3*a*d^2*f^m*x^3*e^(m*log(x) + 1)/(m + 3) + (f*x)^(m + 1)*a*d^3/(f*(m + 1
)) + (((b*f^m*m^3*e^3 + 9*b*f^m*m^2*e^3 + 23*b*f^m*m*e^3 + 15*b*f^m*e^3)*x^
7 + 3*(b*d*f^m*m^3*e^2 + 11*b*d*f^m*m^2*e^2 + 31*b*d*f^m*m*e^2 + 21*b*d*f^m
*e^2)*x^5 + 3*(b*d^2*f^m*m^3*e + 13*b*d^2*f^m*m^2*e + 47*b*d^2*f^m*m*e + 35
*b*d^2*f^m*e)*x^3 + (b*d^3*f^m*m^3 + 15*b*d^3*f^m*m^2 + 71*b*d^3*f^m*m + 10
5*b*d^3*f^m)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (m^4 + 16*
m^3 + 86*m^2 + 176*m + 105)*integrate(-((b*c*f^m*m^3*e^3 + 9*b*c*f^m*m^2*e^
3 + 23*b*c*f^m*m*e^3 + 15*b*c*f^m*e^3)*x^7 + 3*(b*c*d*f^m*m^3*e^2 + 11*b*c*
d*f^m*m^2*e^2 + 31*b*c*d*f^m*m*e^2 + 21*b*c*d*f^m*e^2)*x^5 + 3*(b*c*d^2*f^m
*m^3*e + 13*b*c*d^2*f^m*m^2*e + 47*b*c*d^2*f^m*m*e + 35*b*c*d^2*f^m*e)*x^3
+ (b*c*d^3*f^m*m^3 + 15*b*c*d^3*f^m*m^2 + 71*b*c*d^3*f^m*m + 105*b*c*d^3*f^
m)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/(m^4 + 16*m^3 - (c^2*m^4 + 16*c^2*m^
3 + 86*c^2*m^2 + 176*c^2*m + 105*c^2)*x^2 + 86*m^2 + 176*m + 105), x))/(m^4
 + 16*m^3 + 86*m^2 + 176*m + 105)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*x^6*e^3 + 3*a*d*x^4*e^2 + 3*a*d^2*x^2*e + a*d^3 + (b*x^6*e^3 +
3*b*d*x^4*e^2 + 3*b*d^2*x^2*e + b*d^3)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (fx)^m \left(a + b \operatorname{asin}{(cx)}\right) \left(d + ex^2\right)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Integral((f*x)**m*(a + b*asin(c*x))*(d + e*x**2)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))\,{(f\,x)}^m\,{\left(e\,x^2+d\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^3, x)
```

3.655 $\int (fx)^m (d+ex^2)^2 (a+b\textbf{ArcSin}(cx))\,dx$

Optimal. Leaf size=293

$$\frac{be(2c^2d(5+m)^2+e(12+7m+m^2))(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2}+\frac{be^2(fx)^{4+m}\sqrt{1-c^2x^2}}{cf^4(5+m)^2}+\frac{d^2(fx)^{1+m}(a+b\text{ArcSin}}{f(1+m)}$$

```
[Out] d^2*(f*x)^(1+m)*(a+b*arcsin(c*x))/f/(1+m)+2*d*e*(f*x)^(3+m)*(a+b*arcsin(c*x
))/f^3/(3+m)+e^2*(f*x)^(5+m)*(a+b*arcsin(c*x))/f^5/(5+m)-b*(c^4*d^2*(3+m)*(
5+m)/(1+m)+e*(2+m)*(2*c^2*d*(5+m)^2+e*(m^2+7*m+12))/(3+m)/(5+m))*(f*x)^(2+m
)*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/c^3/f^2/(2+m)/(3+m)/(5+m)+b*e
*(2*c^2*d*(5+m)^2+e*(m^2+7*m+12))*(f*x)^(2+m)*(-c^2*x^2+1)^(1/2)/c^3/f^2/(3
+m)^2/(5+m)^2+b*e^2*(f*x)^(4+m)*(-c^2*x^2+1)^(1/2)/c/f^4/(5+m)^2
```

Rubi [A]

time = 0.31, antiderivative size = 272, normalized size of antiderivative = 0.93, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {276, 4815, 12, 1281, 470, 371}

$$\frac{d^2(fx)^{m+1}(a+b\text{ArcSin}(cx))}{f(m+1)}+\frac{2de(fx)^{m+3}(a+b\text{ArcSin}(cx))}{f^3(m+3)}+\frac{e^2(fx)^{m+5}(a+b\text{ArcSin}(cx))}{f^5(m+5)}+\frac{be^2\sqrt{1-c^2x^2}(fx)^{m+4}}{cf^4(m+5)^2}-\frac{bc(fx)^{m+2}\left(\frac{e(2c^2d(m+5)^2+e(m^2+7m+12))}{c^4(m+3)^2(m+5)^2}+\frac{d^2}{m^2+3m+2}\right){}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{f^2}+\frac{be\sqrt{1-c^2x^2}(fx)^{m+2}(2c^2d(m+5)^2+e(m^2+7m+12))}{c^3f^2(m+3)^2(m+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(2*c^2*d*(5 + m)^2 + e*(12 + 7*m + m^2))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^3*f^2*(3 + m)^2*(5 + m)^2) + (b*e^2*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])
/(c*f^4*(5 + m)^2) + (d^2*(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) +
(2*d*e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f^3*(3 + m)) + (e^2*(f*x)^(5 + m
)*(a + b*ArcSin[c*x]))/(f^5*(5 + m)) - (b*c*(d^2/(2 + 3*m + m^2) + (e*(2*c^
2*d*(5 + m)^2 + e*(12 + 7*m + m^2)))/(c^4*(3 + m)^2*(5 + m)^2))*(f*x)^(2 +
m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
```

```
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] && !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^2 \left(a+b\sin^{-1}(cx)\right)\,dx = \frac{d^2(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} + \cdots$$

$$= \frac{d^2(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} + \cdots$$

$$= \frac{be^2(fx)^{4+m}\sqrt{1-c^2x^2}}{cf^4(5+m)^2} + \frac{d^2(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{2de(fx)\cdots}{\cdots}$$

$$= \frac{be\left(2c^2d(5+m)^2+e(12+7m+m^2)\right)(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2} + \frac{be^2(\cdots}{\cdots}$$

$$= \frac{be\left(2c^2d(5+m)^2+e(12+7m+m^2)\right)(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2} + \frac{be^2(\cdots}{\cdots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 9 vs. order 5 in optimal.
time = 5.56, size = 2792, normalized size = 9.53

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x*(f*x)^m*(-2*(d + e*x^2)^2*(-((2 + m)*(a + b*ArcSin[c*x])) + b*c*x*Hyperg
eometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2]) + 8*e*x^2*(d + e*x^2)*(-a - b*
ArcSin[c*x] + (b*c*x*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])
/(3 + m) + b*c*x*Gamma[2 + m/2]*HypergeometricPFQRegularized[{1/2, 1 + m/2}
, {2 + m/2}, c^2*x^2] - (b*c*x*Gamma[2 + m/2]*Gamma[(3 + m)/2]*Hypergeometr
icPFQRegularized[{1/2, (3 + m)/2}, {(5 + m)/2}, c^2*x^2])/Gamma[1 + m/2]) -
 (4*e*x^2*(d + 3*e*x^2)*((-2*Gamma[1 + m/2]*((4 + m)*(a + b*ArcSin[c*x]) -
b*c*x*Hypergeometric2F1[1/2, 2 + m/2, 3 + m/2, c^2*x^2]))/(4 + m) + b*c*(3
+ m)*x*Gamma[1 + m/2]*Gamma[2 + m/2]*HypergeometricPFQRegularized[{1/2, 1 +
 m/2}, {3 + m/2}, c^2*x^2] + (2*b*c*x*Gamma[2 + m/2]*((3 + m)*Gamma[2 + m/2
]*Gamma[(3 + m)/2] - Gamma[1 + m/2]*Gamma[(5 + m)/2])*HypergeometricPFQRegu
larized[{1/2, 2 + m/2}, {3 + m/2}, c^2*x^2])/Gamma[(3 + m)/2] - 2*b*c*x*((3
 + m)*Gamma[2 + m/2]*Gamma[(3 + m)/2] - Gamma[1 + m/2]*Gamma[(5 + m)/2])*Hy
pergeometricPFQRegularized[{1/2, (3 + m)/2}, {(5 + m)/2}, c^2*x^2]))/((3 +
m)*Gamma[1 + m/2]) - (8*e^2*x^4*(30*a*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(
3 + m)/2] + 6*a*m*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(3 + m)/2] + 30*b*Arc
```

Sin[c*x]*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(3 + m)/2] + 6*b*m*ArcSin[c*x]
*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(3 + m)/2] - 6*b*c*x*Gamma[1 + m/2]*Ga
mma[2 + m/2]*Gamma[(3 + m)/2]*Hypergeometric2F1[1/2, (5 + m)/2, (7 + m)/2,
c^2*x^2] - b*c*(60 + 47*m + 12*m^2 + m^3)*x*Gamma[1 + m/2]*Gamma[2 + m/2]^2
*Gamma[(3 + m)/2]*HypergeometricPFQRegularized[{1/2, 1 + m/2}, {3 + m/2}, c
^2*x^2] + b*c*(5 + m)*x*Gamma[2 + m/2]*(-6*(12 + 7*m + m^2)*Gamma[2 + m/2]^
2*Gamma[(3 + m)/2] + Gamma[1 + m/2]*(-6*Gamma[3 + m/2]*Gamma[(3 + m)/2] + (
4 + m)*Gamma[2 + m/2]*((6 + 5*m + m^2)*Gamma[(3 + m)/2] + 6*Gamma[(5 + m)/2
])))*HypergeometricPFQRegularized[{1/2, 2 + m/2}, {3 + m/2}, c^2*x^2] + 180
*b*c*x*Gamma[2 + m/2]^2*Gamma[(3 + m)/2]^2*HypergeometricPFQRegularized[{1/
2, (3 + m)/2}, {(7 + m)/2}, c^2*x^2] + 141*b*c*m*x*Gamma[2 + m/2]^2*Gamma[(
3 + m)/2]^2*HypergeometricPFQRegularized[{1/2, (3 + m)/2}, {(7 + m)/2}, c^2
*x^2] + 36*b*c*m^2*x*Gamma[2 + m/2]^2*Gamma[(3 + m)/2]^2*HypergeometricPFQR
egularized[{1/2, (3 + m)/2}, {(7 + m)/2}, c^2*x^2] + 3*b*c*m^3*x*Gamma[2 +
m/2]^2*Gamma[(3 + m)/2]^2*HypergeometricPFQRegularized[{1/2, (3 + m)/2}, {(
7 + m)/2}, c^2*x^2] - 60*b*c*x*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(3 + m)/
2]*Gamma[(5 + m)/2]*HypergeometricPFQRegularized[{1/2, (3 + m)/2}, {(7 + m)
/2}, c^2*x^2] - 27*b*c*m*x*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(3 + m)/2]*G
amma[(5 + m)/2]*HypergeometricPFQRegularized[{1/2, (3 + m)/2}, {(7 + m)/2},
 c^2*x^2] - 3*b*c*m^2*x*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(3 + m)/2]*Gamm
a[(5 + m)/2]*HypergeometricPFQRegularized[{1/2, (3 + m)/2}, {(7 + m)/2}, c^
2*x^2] + 240*b*c*x*Gamma[2 + m/2]^2*Gamma[(3 + m)/2]*Gamma[(5 + m)/2]*Hyper
geometricPFQRegularized[{1/2, (5 + m)/2}, {(7 + m)/2}, c^2*x^2] + 188*b*c*m
*x*Gamma[2 + m/2]^2*Gamma[(3 + m)/2]*Gamma[(5 + m)/2]*HypergeometricPFQRegu
larized[{1/2, (5 + m)/2}, {(7 + m)/2}, c^2*x^2] + 48*b*c*m^2*x*Gamma[2 + m/
2]^2*Gamma[(3 + m)/2]*Gamma[(5 + m)/2]*HypergeometricPFQRegularized[{1/2, (
5 + m)/2}, {(7 + m)/2}, c^2*x^2] + 4*b*c*m^3*x*Gamma[2 + m/2]^2*Gamma[(3 +
m)/2]*Gamma[(5 + m)/2]*HypergeometricPFQRegularized[{1/2, (5 + m)/2}, {(7 +
 m)/2}, c^2*x^2] + 30*b*c*x*Gamma[1 + m/2]*Gamma[3 + m/2]*Gamma[(3 + m)/2]*
Gamma[(5 + m)/2]*HypergeometricPFQRegularized[{1/2, (5 + m)/2}, {(7 + m)/2}
, c^2*x^2] + 6*b*c*m*x*Gamma[1 + m/2]*Gamma[3 + m/2]*Gamma[(3 + m)/2]*Gamma
[(5 + m)/2]*HypergeometricPFQRegularized[{1/2, (5 + m)/2}, {(7 + m)/2}, c^2
*x^2] - 120*b*c*x*Gamma[1 + m/2]*Gamma[2 + m/2]*Gamma[(5 + m)/2]^2*Hypergeo
metricPFQRegularized[{1/2, (5 + m)/2}, {(7 + m)/2}, c^2*x^2] - 54*b*c*m*x*G
amma[1 + m/2]*Gamma[2 + m/2]*Gamma[(5 + m)/2]^2*HypergeometricPFQRegularize
d[{1/2, (5 + m)/2}, {(7 + m)/2}, c^2*x^2] - 6*b*c*m^2*x*Gamma[1 + m/2]*Gamm
a[2 + m/2]*Gamma[(5 + m)/2]^2*HypergeometricPFQRegularized[{1/2, (5 + m)/2}
, {(7 + m)/2}, c^2*x^2]))/((3 + m)*(4 + m)*(5 + m)*Gamma[1 + m/2]*Gamma[2 +
 m/2]*Gamma[(3 + m)/2]) + (4*e^2*x^4*(-(b*c*(360 + 342*m + 119*m^2 + 18*m^3
 + m^4)*x*Gamma[1 + m/2]*Gamma[2 + m/2]^2*Gamma[(3 + m)/2]*Gamma[(5 + m)/2]
*HypergeometricPFQRegularized[{1/2, 1 + m/2}, {4 + m/2}, c^2*x^2]) + b*c*(3
0 + 11*m + m^2)*x*Gamma[2 + m/2]*Gamma[(5 + m)/2]*(-6*(12 + 7*m + m^2)*Gamm
a[2 + m/2]^2*Gamma[(3 + m)/2] + Gamma[1 + m/2]*(-6*Gamma[3 + m/2]*Gamma[(3
+ m)/2] + (4 + m)*Gamma[2 + m/2]*((6 + 5*m + m^2)*Gamma[(3 + m)/2] + 6*Gamm
a[(5 + m)/2])))*HypergeometricPFQRegularized[{1/2, 2 + m/2}, {4 + m/2}, c^2

```
*x^2] - 4*b*c*(6 + m)*x*Gamma[3 + m/2]*((60 + 47*m + 12*m^2 + m^3)*Gamma[2
+ m/2]^2*Gamma[(3 + m)/2]*Gamma[(5 + m)/2] + 3*(5 + m)*Gamma[1 + m/2]*Gamma
[3 + m/2]*Gamma[(3 + m)/2]*Gamma[(5 + m)/2] - Gamma[1 + m/2]*Gamma[2 + m/2]
*(2*(20 + 9*m + m^2)*Gamma[(5 + m)/2]^2 + 3*Gamma[(3 + m)/2]*Gamma[(7 + m)/
2]))*HypergeometricPFQRegularized[{1/2, 3 + m/2}, {4 + m/2}, c^2*x^2] + 2*G
amma[(5 + m)/2]*(6*Gamma[1 + m/2]*Gamma[2 + m/2...
```

Maple [F]
time = 8.01, size = 0, normalized size = 0.00

$$\int (fx)^m \left(e\,x^2+d\right)^2 (a+b\arcsin(cx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
[Out] int((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] a*f^m*x^5*e^(m*log(x) + 2)/(m + 5) + 2*a*d*f^m*x^3*e^(m*log(x) + 1)/(m + 3)
 + (f*x)^(m + 1)*a*d^2/(f*(m + 1)) + (((b*f^m*m^2*e^2 + 4*b*f^m*m*e^2 + 3*b
*f^m*e^2)*x^5 + 2*(b*d*f^m*m^2*e + 6*b*d*f^m*m*e + 5*b*d*f^m*e)*x^3 + (b*d^
2*f^m*m^2 + 8*b*d^2*f^m*m + 15*b*d^2*f^m)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)) + (m^3 + 9*m^2 + 23*m + 15)*integrate(-((b*c*f^m*m^2*e^2 +
 4*b*c*f^m*m*e^2 + 3*b*c*f^m*e^2)*x^5 + 2*(b*c*d*f^m*m^2*e + 6*b*c*d*f^m*m*
e + 5*b*c*d*f^m*e)*x^3 + (b*c*d^2*f^m*m^2 + 8*b*c*d^2*f^m*m + 15*b*c*d^2*f^
m)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/(m^3 - (c^2*m^3 + 9*c^2*m^2 + 23*c^2
*m + 15*c^2)*x^2 + 9*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23*m + 15)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((a*x^4*e^2 + 2*a*d*x^2*e + a*d^2 + (b*x^4*e^2 + 2*b*d*x^2*e + b*d^
2)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (fx)^m (a + b\,\mathrm{asin}\,(cx)) \left(d + ex^2\right)^2 \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)**2*(a+b*asin(c*x)),x)
[Out] Integral((f*x)**m*(a + b*asin(c*x))*(d + e*x**2)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{asin}(c\,x))\,(f\,x)^m\,\left(e\,x^2 + d\right)^2 \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^2, x)
```

3.656 $\int (fx)^m (d+ex^2) (a+b\mathbf{ArcSin}(cx)) \, dx$

Optimal. Leaf size=161

$$\frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2}+\frac{d(fx)^{1+m}(a+b\text{ArcSin}(cx))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\text{ArcSin}(cx))}{f^3(3+m)}-\frac{b(e(1+m)(2+m)+c^2 \cdots}{cf^2(1 \cdots}$$

```
[Out] d*(f*x)^(1+m)*(a+b*arcsin(c*x))/f/(1+m)+e*(f*x)^(3+m)*(a+b*arcsin(c*x))/f^3
/(3+m)-b*(e*(1+m)*(2+m)+c^2*d*(3+m)^2)*(f*x)^(2+m)*hypergeom([1/2, 1+1/2*m]
,[2+1/2*m],c^2*x^2)/c/f^2/(1+m)/(2+m)/(3+m)^2+b*e*(f*x)^(2+m)*(-c^2*x^2+1)^
(1/2)/c/f^2/(3+m)^2
```

Rubi [A]
time = 0.13, antiderivative size = 148, normalized size of antiderivative = 0.92, number of steps used = 4, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {14, 4815, 12, 470, 371}

$$\frac{d(fx)^{m+1}(a+b\text{ArcSin}(cx))}{f(m+1)}+\frac{e(fx)^{m+3}(a+b\text{ArcSin}(cx))}{f^3(m+3)}-\frac{bc(fx)^{m+2}\left(\frac{e}{c^2(m+3)^2}+\frac{d}{m^2+3m+2}\right){}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+4}{2};c^2x^2\right)}{f^2}+\frac{be\sqrt{1-c^2x^2}\,(fx)^{m+2}}{cf^2(m+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(f*x)^(2 + m)*Sqrt[1 - c^2*x^2])/(c*f^2*(3 + m)^2) + (d*(f*x)^(1 + m)*
(a + b*ArcSin[c*x]))/(f*(1 + m)) + (e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f
^3*(3 + m)) - (b*c*(e/(c^2*(3 + m)^2) + d/(2 + 3*m + m^2))*(f*x)^(2 + m)*Hy
pergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right) \left(a+b\sin^{-1}(cx)\right)\,dx = \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} - (bc)$$

$$= \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}\left(a+b\sin^{-1}(cx)\right)}{f^3(3+m)} - \frac{(bc)}{}$$

$$= \frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2} + \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}}{f}$$

$$= \frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2} + \frac{d(fx)^{1+m}\left(a+b\sin^{-1}(cx)\right)}{f(1+m)} + \frac{e(fx)^{3+m}}{f}$$

Mathematica [C] Result contains higher order function than in optimal. Order 9 vs. order 5 in optimal.
time = 1.40, size = 508, normalized size = 3.16

$$\frac{x(fx)^m\left(-\left((d+ex^2)\left(-((2+m)(a+b\text{ArcSin}(cx)))+bcx\,{}_2F_1\left(\tfrac{1}{2},1+\tfrac{m}{2};2+\tfrac{m}{2};c^2x^2\right)\right)\right)+2ex^2\left(-a-b\text{ArcSin}(cx)+\frac{bcx\,{}_2F_1\left(\frac{1}{2},\frac{3+m}{2};\frac{5+m}{2};c^2x^2\right)}{3+m}+bcx\text{Gamma}\left(2+\tfrac{m}{2}\right){}_2\tilde{F}_1\left(\tfrac{1}{2},1+\tfrac{m}{2};2+\tfrac{m}{2};c^2x^2\right)-\frac{bcx\text{Gamma}\left(2+\frac{m}{2}\right)\text{Gamma}\left(\frac{3+m}{2}\right){}_2\tilde{F}_1\left(\frac{1}{2},\frac{3+m}{2};\frac{5+m}{2};c^2x^2\right)}{\text{Gamma}\left(1+\frac{m}{2}\right)}\right)-\frac{ex^2\left(-\frac{2\text{Gamma}\left(1+\frac{m}{2}\right)\left((4+m)(a+b\text{ArcSin}(cx))-bcx\,{}_2F_1\left(\frac{1}{2},2+\frac{m}{2};3+\frac{m}{2};c^2x^2\right)\right)}{4+m}+bc(3+m)x\text{Gamma}\left(1+\frac{m}{2}\right)\text{Gamma}\left(2+\frac{m}{2}\right){}_2\tilde{F}_1\left(\frac{1}{2},1+\frac{m}{2};3+\frac{m}{2};c^2x^2\right)+\frac{2bcx\text{Gamma}\left(2+\frac{m}{2}\right)\left((3+m)\text{Gamma}\left(2+\frac{m}{2}\right)\text{Gamma}\left(\frac{3+m}{2}\right)-\text{Gamma}\left(1+\frac{m}{2}\right)\text{Gamma}\left(\frac{5+m}{2}\right)\right){}_2\tilde{F}_1\left(\frac{1}{2},2+\frac{m}{2};3+\frac{m}{2};c^2x^2\right)}{\text{Gamma}\left(\frac{3+m}{2}\right)}-2bcx\left((3+m)\text{Gamma}\left(2+\frac{m}{2}\right)\text{Gamma}\left(\frac{3+m}{2}\right)-\text{Gamma}\left(1+\frac{m}{2}\right)\text{Gamma}\left(\frac{5+m}{2}\right)\right){}_2\tilde{F}_1\left(\frac{1}{2},\frac{3+m}{2};\frac{5+m}{2};c^2x^2\right)\right)}{(3+m)\text{Gamma}\left(1+\frac{m}{2}\right)}\right)}{(1+m)(2+m)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x*(f*x)^m*(-((d + e*x^2)*(-((2 + m)*(a + b*ArcSin[c*x])) + b*c*x*Hypergeom
etric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2])) + 2*e*x^2*(-a - b*ArcSin[c*x] +
(b*c*x*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/(3 + m) + b*c
*x*Gamma[2 + m/2]*HypergeometricPFQRegularized[{1/2, 1 + m/2}, {2 + m/2}, c
^2*x^2] - (b*c*x*Gamma[2 + m/2]*Gamma[(3 + m)/2]*HypergeometricPFQRegulariz
```

```
ed[{1/2, (3 + m)/2}, {(5 + m)/2}, c^2*x^2])/Gamma[1 + m/2]) - (e*x^2*((-2*G
amma[1 + m/2]*((4 + m)*(a + b*ArcSin[c*x]) - b*c*x*Hypergeometric2F1[1/2, 2
 + m/2, 3 + m/2, c^2*x^2]))/(4 + m) + b*c*(3 + m)*x*Gamma[1 + m/2]*Gamma[2
+ m/2]*HypergeometricPFQRegularized[{1/2, 1 + m/2}, {3 + m/2}, c^2*x^2] + (
2*b*c*x*Gamma[2 + m/2]*((3 + m)*Gamma[2 + m/2]*Gamma[(3 + m)/2] - Gamma[1 +
 m/2]*Gamma[(5 + m)/2])*HypergeometricPFQRegularized[{1/2, 2 + m/2}, {3 + m
/2}, c^2*x^2])/Gamma[(3 + m)/2] - 2*b*c*x*((3 + m)*Gamma[2 + m/2]*Gamma[(3
+ m)/2] - Gamma[1 + m/2]*Gamma[(5 + m)/2])*HypergeometricPFQRegularized[{1/
2, (3 + m)/2}, {(5 + m)/2}, c^2*x^2]))/((3 + m)*Gamma[1 + m/2])))/((1 + m)*
(2 + m))
```

Maple [F]
time = 3.32, size = 0, normalized size = 0.00

$$\int \left(f x\right)^{m} \left(e\,x^{2}+d\right) \left(a +b \arcsin \left(c x \right)\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x)
[Out] int((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] a*f^m*x^3*e^(m*log(x) + 1)/(m + 3) + (f*x)^(m + 1)*a*d/(f*(m + 1)) + (((b*f
^m*m*e + b*f^m*e)*x^3 + (b*d*f^m*m + 3*b*d*f^m)*x)*x^m*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)) + (m^2 + 4*m + 3)*integrate(((b*c*f^m*m*e + b*c*f^m*
e)*x^3 + (b*c*d*f^m*m + 3*b*c*d*f^m)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/((
c^2*m^2 + 4*c^2*m + 3*c^2)*x^2 - m^2 - 4*m - 3), x))/(m^2 + 4*m + 3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((a*x^2*e + a*d + (b*x^2*e + b*d)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (fx)^m (a + b\,\mathrm{asin}\,(cx)) \left(d + ex^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)*(a+b*asin(c*x)),x)
[Out] Integral((f*x)**m*(a + b*asin(c*x))*(d + e*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int (a + b\,\mathrm{asin}(c\,x))\,(f\,x)^m\,\left(e\,x^2 + d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2),x)
[Out] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2), x)
```

3.657 $\int \frac{(fx)^m(a+b\mathbf{ArcSin}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{(fx)^m(a+b\text{ArcSin}(cx))}{d+ex^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(fx)^m(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2), x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx = \int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{d+ex^2}\,dx$$

Mathematica [A]
time = 7.18, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m(a+b\text{ArcSin}(cx))}{d+ex^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2), x]
```

Maple [A]
time = 1.84, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m\left(a+b\arcsin\left(cx\right)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)
[Out] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(x^2*e + d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)*(f*x)^m/(x^2*e + d), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m (a + b\operatorname{asin}(cx))}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*asin(c*x))/(e*x**2+d),x)
[Out] Integral((f*x)**m*(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{(a + b\operatorname{asin}(c\,x))\,(f\,x)^m}{e\,x^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2),x)
[Out] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2), x)
```

3.658 $\int \frac{(fx)^m(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{(fx)^m(a+b\text{ArcSin}(cx))}{(d+ex^2)^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(fx)^m(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
[Out] Defer[Int][((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{(d+ex^2)^2}\,dx = \int \frac{(fx)^m\left(a+b\sin^{-1}(cx)\right)}{(d+ex^2)^2}\,dx$$

Mathematica [A]
time = 9.67, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m(a+b\text{ArcSin}(cx))}{(d+ex^2)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
[Out] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2, x]
```

Maple [A]
time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m\left(a+b\arcsin\left(cx\right)\right)}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

```
[Out] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(x^2*e + d)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)*(f*x)^m/(x^4*e^2 + 2*d*x^2*e + d^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f\,x\right)^m}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2)^2,x)
[Out] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2)^2, x)
```

3.659 $\int (d+ex^2)^3 (a+b\text{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=569

$$-2b^2d^3x-\frac{4b^2d^2ex}{3c^2}-\frac{16b^2de^2x}{25c^4}-\frac{32b^2e^3x}{245c^6}-\frac{2}{9}b^2d^2ex^3-\frac{8b^2de^2x^3}{75c^2}-\frac{16b^2e^3x^3}{735c^4}-\frac{6}{125}b^2de^2x^5-\frac{12b^2e^3x^5}{1225c^2}-\frac{2}{343}b^2e^3x$$

```
[Out] -2*b^2*d^3*x-4/3*b^2*d^2*e*x/c^2-16/25*b^2*d*e^2*x/c^4-32/245*b^2*e^3*x/c^6
-2/9*b^2*d^2*e*x^3-8/75*b^2*d*e^2*x^3/c^2-16/735*b^2*e^3*x^3/c^4-6/125*b^2*
d*e^2*x^5-12/1225*b^2*e^3*x^5/c^2-2/343*b^2*e^3*x^7+d^3*x*(a+b*arcsin(c*x))
^2+d^2*e*x^3*(a+b*arcsin(c*x))^2+3/5*d*e^2*x^5*(a+b*arcsin(c*x))^2+1/7*e^3*
x^7*(a+b*arcsin(c*x))^2+2*b*d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+4/3*
b*d^2*e*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/25*b*d*e^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c^5+32/245*b*e^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1
/2)/c^7+2/3*b*d^2*e*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+8/25*b*d*e^2
*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/245*b*e^3*x^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c^5+6/25*b*d*e^2*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1
)^(1/2)/c+12/245*b*e^3*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+2/49*b*
e^3*x^6*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.65, antiderivative size = 569, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used = {4757, 4715, 4767, 8, 4723, 4795, 30}

$$\frac{2bd^3\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{c}+\frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{3c}+\frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{25c}+\frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{49c}+\frac{32be^3\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{245c^7}+\frac{16bde^2\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{25c^5}+\frac{16be^3x^2\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{245c^5}+\frac{4bd^2e\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{3c^3}+\frac{8bde^2x^2\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{25c^3}+\frac{12be^3x^4\sqrt{1-c^2x^2}(a+b\text{ArcSin}(cx))}{245c^3}+d^3x(a+b\text{ArcSin}(cx))^2+d^2ex^3(a+b\text{ArcSin}(cx))^2+\frac{3}{5}de^2x^5(a+b\text{ArcSin}(cx))^2+\frac{1}{7}e^3x^7(a+b\text{ArcSin}(cx))^2-\frac{32b^2e^3x}{245c^6}-\frac{16b^2de^2x}{25c^4}-\frac{16b^2e^3x^3}{735c^4}-\frac{4b^2d^2ex}{3c^2}-\frac{8b^2de^2x^3}{75c^2}-\frac{12b^2e^3x^5}{1225c^2}-2b^2d^3x-\frac{2}{9}b^2d^2ex^3-\frac{6}{125}b^2de^2x^5-\frac{2}{343}b^2e^3x^7$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d^3*x - (4*b^2*d^2*e*x)/(3*c^2) - (16*b^2*d*e^2*x)/(25*c^4) - (32*b^
2*e^3*x)/(245*c^6) - (2*b^2*d^2*e*x^3)/9 - (8*b^2*d*e^2*x^3)/(75*c^2) - (16
*b^2*e^3*x^3)/(735*c^4) - (6*b^2*d*e^2*x^5)/125 - (12*b^2*e^3*x^5)/(1225*c^
2) - (2*b^2*e^3*x^7)/343 + (2*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
c + (4*b*d^2*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^3) + (16*b*d*e^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c^5) + (32*b*e^3*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/(245*c^7) + (2*b*d^2*e*x^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x]))/(3*c) + (8*b*d*e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(25*c^3) + (16*b*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^5
) + (6*b*d*e^2*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + (12*b*e^
3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^3) + (2*b*e^3*x^6*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(49*c) + d^3*x*(a + b*ArcSin[c*x])^2 + d^
2*e*x^3*(a + b*ArcSin[c*x])^2 + (3*d*e^2*x^5*(a + b*ArcSin[c*x])^2)/5 + (e^
3*x^7*(a + b*ArcSin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)^3 \left(a+b\sin^{-1}(cx)\right)^2 \, dx = \int \left(d^3\left(a+b\sin^{-1}(cx)\right)^2+3d^2ex^2\left(a+b\sin^{-1}(cx)\right)^2+3de^2x^4\left(a+b\sin\right.\right.$$

$$= d^3\int \left(a+b\sin^{-1}(cx)\right)^2 \, dx+\left(3d^2e\right)\int x^2\left(a+b\sin^{-1}(cx)\right)^2 \, dx+\left(3de\right.$$

$$= d^3x\left(a+b\sin^{-1}(cx)\right)^2+d^2ex^3\left(a+b\sin^{-1}(cx)\right)^2+\frac{3}{5}de^2x^5\left(a+b\sin^{-1}\right.$$

$$= \frac{2bd^3\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{2bd^2ex^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx\right.}{3c}$$

$$= -2b^2d^3x-\frac{2}{9}b^2d^2ex^3-\frac{6}{125}b^2de^2x^5-\frac{2}{343}b^2e^3x^7+\frac{2bd^3\sqrt{1-c^2x^2}\left(a\right.}{c}$$

$$= -2b^2d^3x-\frac{4b^2d^2ex}{3c^2}-\frac{2}{9}b^2d^2ex^3-\frac{8b^2de^2x^3}{75c^2}-\frac{6}{125}b^2de^2x^5-\frac{12b^2e^3x^5}{1225c^2}$$

$$= -2b^2d^3x-\frac{4b^2d^2ex}{3c^2}-\frac{16b^2de^2x}{25c^4}-\frac{2}{9}b^2d^2ex^3-\frac{8b^2de^2x^3}{75c^2}-\frac{16b^2e^3x^3}{735c^4}-$$

$$= -2b^2d^3x-\frac{4b^2d^2ex}{3c^2}-\frac{16b^2de^2x}{25c^4}-\frac{32b^2e^3x}{245c^6}-\frac{2}{9}b^2d^2ex^3-\frac{8b^2de^2x^3}{75c^2}-$$

Mathematica [A]
time = 0.34, size = 445, normalized size = 0.78

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (11025*a^2*c^7*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6) + 210*a
*b*Sqrt[1 - c^2*x^2]*(240*e^3 + 24*c^2*e^2*(49*d + 5*e*x^2) + 2*c^4*e*(1225
*d^2 + 294*d*e*x^2 + 45*e^2*x^4) + c^6*(3675*d^3 + 1225*d^2*e*x^2 + 441*d*e
^2*x^4 + 75*e^3*x^6)) - 2*b^2*c*x*(25200*e^3 + 840*c^2*e^2*(147*d + 5*e*x^2
) + 210*c^4*e*(1225*d^2 + 98*d*e*x^2 + 9*e^2*x^4) + c^6*(385875*d^3 + 42875
*d^2*e*x^2 + 9261*d*e^2*x^4 + 1125*e^3*x^6)) + 210*b*(105*a*c^7*x*(35*d^3 +
 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6) + b*Sqrt[1 - c^2*x^2]*(240*e^3 +
24*c^2*e^2*(49*d + 5*e*x^2) + 2*c^4*e*(1225*d^2 + 294*d*e*x^2 + 45*e^2*x^4)
 + c^6*(3675*d^3 + 1225*d^2*e*x^2 + 441*d*e^2*x^4 + 75*e^3*x^6)))*ArcSin[c*
x] + 11025*b^2*c^7*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6)*Arc
Sin[c*x]^2)/(385875*c^7)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1193 vs. $2(509) = 1018$.
time = 0.35, size = 1194, normalized size = 2.10 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2/c^6*(d^3*c^7*x+d^2*c^7*e*x^3+3/5*d*c^7*e^2*x^5+1/7*e^3*c^7*x^7)+b^
2/c^6*(1/385875*e^3*(55125*arcsin(c*x)^2*c^7*x^7+15750*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*c^6*x^6-231525*arcsin(c*x)^2*c^5*x^5-2250*c^7*x^7-73710*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4+385875*c^3*x^3*arcsin(c*x)^2+14742*c^5*x^5+1
58970*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-385875*c*x*arcsin(c*x)^2-52990
*c^3*x^3-453810*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+453810*c*x)+1/1125*c^2*d*e^2
*(675*arcsin(c*x)^2*c^5*x^5+270*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4-2250
*c^3*x^3*arcsin(c*x)^2-54*c^5*x^5-1140*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x
^2+3375*c*x*arcsin(c*x)^2+380*c^3*x^3+4470*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-4
470*c*x)+1/1125*e^3*(675*arcsin(c*x)^2*c^5*x^5+270*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)*c^4*x^4-2250*c^3*x^3*arcsin(c*x)^2-54*c^5*x^5-1140*arcsin(c*x)*(-c^2
*x^2+1)^(1/2)*c^2*x^2+3375*c*x*arcsin(c*x)^2+380*c^3*x^3+4470*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)-4470*c*x)+1/9*c^4*d^2*e*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*c*x*arcsin(c*x)^2-2*c^3*x^3-42*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+2/9*c^2*d*e^2*(9*c^3*x^3*arcsin(c*x)^2+6*arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*c*x*arcsin(c*x)^2-2*c^3*x^3-42*arcsi
n(c*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+1/9*e^3*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*c*x*arcsin(c*x)^2-2*c^3*x^3-42*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+c^6*d^3*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*
x)*(-c^2*x^2+1)^(1/2))+3*c^4*d^2*e*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(
-c^2*x^2+1)^(1/2))+3*c^2*d*e^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2
*x^2+1)^(1/2))+e^3*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)))+2*a*b/c^6*(arcsin(c*x)*d^3*c^7*x+arcsin(c*x)*d^2*c^7*e*x^3+3/5*arcsin(c
*x)*d*c^7*e^2*x^5+1/7*arcsin(c*x)*e^3*c^7*x^7+d^3*c^6*(-c^2*x^2+1)^(1/2)-d^
2*c^4*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-3/5*d*c^2*
e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(
-c^2*x^2+1)^(1/2))-1/7*e^3*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-
c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2)))
)
```

Maxima [A]
time = 0.52, size = 695, normalized size = 1.22

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*x^7*arcsin(c*x)^2*e^3 + 3/5*b^2*d*x^5*arcsin(c*x)^2*e^2 + 1/7*a^2*x
^7*e^3 + b^2*d^2*x^3*arcsin(c*x)^2*e + 3/5*a^2*d*x^5*e^2 + b^2*d^3*x*arcsin
(c*x)^2 + a^2*d^2*x^3*e - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c)
+ a^2*d^3*x + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sq
rt(-c^2*x^2 + 1)/c^4))*a*b*d^2*e + 2/9*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2
*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2*d^2*e + 2*(
c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^3/c + 2/25*(15*x^5*arcsin(c*x)
+ (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c)*a*b*d*e^2 + 2/375*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*
sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c
^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*d*e^2 + 2/245*(35*x^7*arcsin(c*x) + (
5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x
^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*e^3 + 2/25725*(105*(5*s
qrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2
+ 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126
*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*e^3
```

Fricas [A]
time = 2.25, size = 537, normalized size = 0.94

$$\frac{385875\,(a^2-2\,b^2)c^7d^3x+11025\,(5\,b^2c^7x^7e^3+21\,b^2c^7dx^5e^2+35\,b^2c^7d^2x^3e+35\,b^2c^7d^3x)\arcsin(cx)^2+22050\,(5\,abc^7x^7e^3+21\,abc^7dx^5e^2+35\,abc^7d^2x^3e+35\,abc^7d^3x)\arcsin(cx)+15\,(75\,(49\,a^2-2\,b^2)c^7x^7-252\,b^2c^5x^5-560\,b^2c^3x^3-3360\,b^2cx)e^3+1029\,(9\,(25\,a^2-2\,b^2)c^7dx^5-40\,b^2c^5dx^3-240\,b^2c^3dx)e^2+42875\,((9\,a^2-2\,b^2)c^7d^2x^3-12\,b^2c^5d^2x)e+210\,(3675\,abc^6d^3+(3675\,b^2c^6d^3+15\,(5\,b^2c^6x^6+6\,b^2c^4x^4+8\,b^2c^2x^2+16\,b^2)e^3+147\,(3\,b^2c^6dx^4+4\,b^2c^4dx^2+8\,b^2c^2d)e^2+1225\,(b^2c^6d^2x^2+2\,b^2c^4d^2)e)\arcsin(cx)+15\,(5\,abc^6x^6+6\,abc^4x^4+8\,abc^2x^2+16\,ab)e^3+147\,(3\,abc^6dx^4+4\,abc^4dx^2+8\,abc^2d)e^2+1225\,(abc^6d^2x^2+2\,abc^4d^2)e)\sqrt{-c^2x^2+1}}{385875\,c^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/385875*(385875*(a^2 - 2*b^2)*c^7*d^3*x + 11025*(5*b^2*c^7*x^7*e^3 + 21*b^
2*c^7*d*x^5*e^2 + 35*b^2*c^7*d^2*x^3*e + 35*b^2*c^7*d^3*x)*arcsin(c*x)^2 +
22050*(5*a*b*c^7*x^7*e^3 + 21*a*b*c^7*d*x^5*e^2 + 35*a*b*c^7*d^2*x^3*e + 35
*a*b*c^7*d^3*x)*arcsin(c*x) + 15*(75*(49*a^2 - 2*b^2)*c^7*x^7 - 252*b^2*c^5
*x^5 - 560*b^2*c^3*x^3 - 3360*b^2*c*x)*e^3 + 1029*(9*(25*a^2 - 2*b^2)*c^7*d
*x^5 - 40*b^2*c^5*d*x^3 - 240*b^2*c^3*d*x)*e^2 + 42875*((9*a^2 - 2*b^2)*c^7
*d^2*x^3 - 12*b^2*c^5*d^2*x)*e + 210*(3675*a*b*c^6*d^3 + (3675*b^2*c^6*d^3
+ 15*(5*b^2*c^6*x^6 + 6*b^2*c^4*x^4 + 8*b^2*c^2*x^2 + 16*b^2)*e^3 + 147*(3*
b^2*c^6*d*x^4 + 4*b^2*c^4*d*x^2 + 8*b^2*c^2*d)*e^2 + 1225*(b^2*c^6*d^2*x^2
+ 2*b^2*c^4*d^2)*e)*arcsin(c*x) + 15*(5*a*b*c^6*x^6 + 6*a*b*c^4*x^4 + 8*a*b
*c^2*x^2 + 16*a*b)*e^3 + 147*(3*a*b*c^6*d*x^4 + 4*a*b*c^4*d*x^2 + 8*a*b*c^2
*d)*e^2 + 1225*(a*b*c^6*d^2*x^2 + 2*a*b*c^4*d^2)*e)*sqrt(-c^2*x^2 + 1))/c^7
```

Sympy [A]
time = 1.28, size = 989, normalized size = 1.74

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**3*x + a**2*d**2*e*x**3 + 3*a**2*d*e**2*x**5/5 + a**2*e**
3*x**7/7 + 2*a*b*d**3*x*asin(c*x) + 2*a*b*d**2*e*x**3*asin(c*x) + 6*a*b*d*e
**2*x**5*asin(c*x)/5 + 2*a*b*e**3*x**7*asin(c*x)/7 + 2*a*b*d**3*sqrt(-c**2*
x**2 + 1)/c + 2*a*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 6*a*b*d*e**2*x
**4*sqrt(-c**2*x**2 + 1)/(25*c) + 2*a*b*e**3*x**6*sqrt(-c**2*x**2 + 1)/(49*
c) + 4*a*b*d**2*e*sqrt(-c**2*x**2 + 1)/(3*c**3) + 8*a*b*d*e**2*x**2*sqrt(-c
**2*x**2 + 1)/(25*c**3) + 12*a*b*e**3*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3)
+ 16*a*b*d*e**2*sqrt(-c**2*x**2 + 1)/(25*c**5) + 16*a*b*e**3*x**2*sqrt(-c**
2*x**2 + 1)/(245*c**5) + 32*a*b*e**3*sqrt(-c**2*x**2 + 1)/(245*c**7) + b**2
*d**3*x*asin(c*x)**2 - 2*b**2*d**3*x + b**2*d**2*e*x**3*asin(c*x)**2 - 2*b*
*2*d**2*e*x**3/9 + 3*b**2*d*e**2*x**5*asin(c*x)**2/5 - 6*b**2*d*e**2*x**5/1
25 + b**2*e**3*x**7*asin(c*x)**2/7 - 2*b**2*e**3*x**7/343 + 2*b**2*d**3*sqr
t(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*d**2*e*x**2*sqrt(-c**2*x**2 + 1)*asi
n(c*x)/(3*c) + 6*b**2*d*e**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) + 2
*b**2*e**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/(49*c) - 4*b**2*d**2*e*x/(3*
c**2) - 8*b**2*d*e**2*x**3/(75*c**2) - 12*b**2*e**3*x**5/(1225*c**2) + 4*b*
*2*d**2*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c**3) + 8*b**2*d*e**2*x**2*sqrt
(-c**2*x**2 + 1)*asin(c*x)/(25*c**3) + 12*b**2*e**3*x**4*sqrt(-c**2*x**2 +
1)*asin(c*x)/(245*c**3) - 16*b**2*d*e**2*x/(25*c**4) - 16*b**2*e**3*x**3/(7
35*c**4) + 16*b**2*d*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c**5) + 16*b**
2*e**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(245*c**5) - 32*b**2*e**3*x/(245
*c**6) + 32*b**2*e**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(245*c**7), Ne(c, 0)),
 (a**2*(d**3*x + d**2*e*x**3 + 3*d*e**2*x**5/5 + e**3*x**7/7), True))
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1242 vs. $2(509) = 1018$.
time = 0.49, size = 1242, normalized size = 2.18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/7*a^2*e^3*x^7 + 3/5*a^2*d*e^2*x^5 + a^2*d^2*e*x^3 + b^2*d^3*x*arcsin(c*x)
^2 + 2*a*b*d^3*x*arcsin(c*x) + (c^2*x^2 - 1)*b^2*d^2*e*x*arcsin(c*x)^2/c^2
+ a^2*d^3*x - 2*b^2*d^3*x + 2*(c^2*x^2 - 1)*a*b*d^2*e*x*arcsin(c*x)/c^2 + b
^2*d^2*e*x*arcsin(c*x)^2/c^2 + 3/5*(c^2*x^2 - 1)^2*b^2*d*e^2*x*arcsin(c*x)^
2/c^4 + 2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c - 2/9*(c^2*x^2 - 1)*b^2*
d^2*e*x/c^2 + 2*a*b*d^2*e*x*arcsin(c*x)/c^2 + 6/5*(c^2*x^2 - 1)^2*a*b*d*e^2
*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b^2*d*e^2*x*arcsin(c*x)^2/c^4 + 1/7*
(c^2*x^2 - 1)^3*b^2*e^3*x*arcsin(c*x)^2/c^6 + 2*sqrt(-c^2*x^2 + 1)*a*b*d^3/
c - 2/3*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*e*arcsin(c*x)/c^3 - 14/9*b^2*d^2*e*x/c
^2 - 6/125*(c^2*x^2 - 1)^2*b^2*d*e^2*x/c^4 + 12/5*(c^2*x^2 - 1)*a*b*d*e^2*x
*arcsin(c*x)/c^4 + 2/7*(c^2*x^2 - 1)^3*a*b*e^3*x*arcsin(c*x)/c^6 + 3/5*b^2*
d*e^2*x*arcsin(c*x)^2/c^4 + 3/7*(c^2*x^2 - 1)^2*b^2*e^3*x*arcsin(c*x)^2/c^6
```

```
 - 2/3*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*e/c^3 + 2*sqrt(-c^2*x^2 + 1)*b^2*d^2*e*
arcsin(c*x)/c^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*e^2*arcsin(
c*x)/c^5 - 76/375*(c^2*x^2 - 1)*b^2*d*e^2*x/c^4 - 2/343*(c^2*x^2 - 1)^3*b^2
*e^3*x/c^6 + 6/5*a*b*d*e^2*x*arcsin(c*x)/c^4 + 6/7*(c^2*x^2 - 1)^2*a*b*e^3*
x*arcsin(c*x)/c^6 + 3/7*(c^2*x^2 - 1)*b^2*e^3*x*arcsin(c*x)^2/c^6 + 2*sqrt(
-c^2*x^2 + 1)*a*b*d^2*e/c^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d
*e^2/c^5 - 4/5*(-c^2*x^2 + 1)^(3/2)*b^2*d*e^2*arcsin(c*x)/c^5 + 2/49*(c^2*x
^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*e^3*arcsin(c*x)/c^7 - 298/375*b^2*d*e^2*x/
c^4 - 234/8575*(c^2*x^2 - 1)^2*b^2*e^3*x/c^6 + 6/7*(c^2*x^2 - 1)*a*b*e^3*x*
arcsin(c*x)/c^6 + 1/7*b^2*e^3*x*arcsin(c*x)^2/c^6 - 4/5*(-c^2*x^2 + 1)^(3/2
)*a*b*d*e^2/c^5 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7 + 6/5
*sqrt(-c^2*x^2 + 1)*b^2*d*e^2*arcsin(c*x)/c^5 + 6/35*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b^2*e^3*arcsin(c*x)/c^7 - 1514/25725*(c^2*x^2 - 1)*b^2*e^3*x/c
^6 + 2/7*a*b*e^3*x*arcsin(c*x)/c^6 + 6/5*sqrt(-c^2*x^2 + 1)*a*b*d*e^2/c^5 +
 6/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7 - 2/7*(-c^2*x^2 + 1)^(
3/2)*b^2*e^3*arcsin(c*x)/c^7 - 4322/25725*b^2*e^3*x/c^6 - 2/7*(-c^2*x^2 + 1
)^(3/2)*a*b*e^3/c^7 + 2/7*sqrt(-c^2*x^2 + 1)*b^2*e^3*arcsin(c*x)/c^7 + 2/7*
sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\left(e\,x^2+d\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x^2)^3, x)
```

3.660 $\int (d+ex^2)^2 (a+b\mathbf{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=335

$$-2b^2d^2x-\frac{8b^2dex}{9c^2}-\frac{16b^2e^2x}{75c^4}-\frac{4}{27}b^2dex^3-\frac{8b^2e^2x^3}{225c^2}-\frac{2}{125}b^2e^2x^5+\frac{2bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c}+\frac{8bde\sqrt{1}$$

```
[Out] -2*b^2*d^2*x-8/9*b^2*d*e*x/c^2-16/75*b^2*e^2*x/c^4-4/27*b^2*d*e*x^3-8/225*b
^2*e^2*x^3/c^2-2/125*b^2*e^2*x^5+d^2*x*(a+b*arcsin(c*x))^2+2/3*d*e*x^3*(a+b
*arcsin(c*x))^2+1/5*e^2*x^5*(a+b*arcsin(c*x))^2+2*b*d^2*(a+b*arcsin(c*x))*(
-c^2*x^2+1)^(1/2)/c+8/9*b*d*e*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/7
5*b*e^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+4/9*b*d*e*x^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c+8/75*b*e^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1
/2)/c^3+2/25*b*e^2*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.39, antiderivative size = 335, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used = {4757, 4715, 4767, 8, 4723, 4795, 30}

$$\frac{2bd^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c}+\frac{4bdex^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c}+\frac{2be^2x^4\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{25c}+\frac{16be^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{75c^5}+\frac{8bde\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^3}+\frac{8be^2x^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{75c^3}+d^2x(a+b\text{ArcSin}(cx))^2+\frac{2}{3}dex^3(a+b\text{ArcSin}(cx))^2+\frac{1}{5}e^2x^5(a+b\text{ArcSin}(cx))^2-\frac{16b^2e^2x}{75c^4}-\frac{8b^2dex}{9c^2}-\frac{8b^2e^2x^3}{225c^2}-2b^2d^2x-\frac{4}{27}b^2dex^3-\frac{2}{125}b^2e^2x^5$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d^2*x - (8*b^2*d*e*x)/(9*c^2) - (16*b^2*e^2*x)/(75*c^4) - (4*b^2*d*e
*x^3)/27 - (8*b^2*e^2*x^3)/(225*c^2) - (2*b^2*e^2*x^5)/125 + (2*b*d^2*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (8*b*d*e*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x]))/(9*c^3) + (16*b*e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c
^5) + (4*b*d*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + (8*b*e^2*
x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^3) + (2*b*e^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + d^2*x*(a + b*ArcSin[c*x])^2 + (2*d*
e*x^3*(a + b*ArcSin[c*x])^2)/3 + (e^2*x^5*(a + b*ArcSin[c*x])^2)/5
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
```

```
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int (d+ex^2)^2 (a+b\sin^{-1}(cx))^2 \, dx = \int \left(d^2(a+b\sin^{-1}(cx))^2 + 2dex^2(a+b\sin^{-1}(cx))^2 + e^2x^4(a+b\sin^{-1}\right.$$

$$= d^2 \int (a+b\sin^{-1}(cx))^2 \, dx + (2de) \int x^2 (a+b\sin^{-1}(cx))^2 \, dx + e^2 \int$$

$$= d^2x(a+b\sin^{-1}(cx))^2 + \frac{2}{3}dex^3(a+b\sin^{-1}(cx))^2 + \frac{1}{5}e^2x^5(a+b\sin^{-1}$$

$$= \frac{2bd^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c} + \frac{4bdex^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx}{9c}$$

$$= -2b^2d^2x - \frac{4}{27}b^2dex^3 - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx)}{c}$$

$$= -2b^2d^2x - \frac{8b^2dex}{9c^2} - \frac{4}{27}b^2dex^3 - \frac{8b^2e^2x^3}{225c^2} - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-}}{}$$

$$= -2b^2d^2x - \frac{8b^2dex}{9c^2} - \frac{16b^2e^2x}{75c^4} - \frac{4}{27}b^2dex^3 - \frac{8b^2e^2x^3}{225c^2} - \frac{2}{125}b^2e^2x^5 +$$

Mathematica [A]
time = 0.24, size = 291, normalized size = 0.87

$$\frac{225a^2c^5x(15d^2+10dex^2+3e^2x^4)+30ab\sqrt{1-c^2x^2}\,(24e^2+4c^2e(25d+3ex^2)+c^4(225d^2+50dex^2+9e^2x^4))-2b^2cx(360e^2+60c^2e(25d+ex^2)+c^4(3375d^2+250dex^2+27e^2x^4))+30b\left(15ac^5x(15d^2+10dex^2+3e^2x^4)+b\sqrt{1-c^2x^2}\,(24e^2+4c^2e(25d+3ex^2)+c^4(225d^2+50dex^2+9e^2x^4))\right)\mathrm{ArcSin}(cx)+225b^2c^5x(15d^2+10dex^2+3e^2x^4)\,\mathrm{ArcSin}(cx)^2}{3375c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (225*a^2*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) + 30*a*b*Sqrt[1 - c^2*x^2]
*(24*e^2 + 4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*d*e*x^2 + 9*e^2*x^4
)) - 2*b^2*c*x*(360*e^2 + 60*c^2*e*(25*d + e*x^2) + c^4*(3375*d^2 + 250*d*e
*x^2 + 27*e^2*x^4)) + 30*b*(15*a*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) +
b*Sqrt[1 - c^2*x^2]*(24*e^2 + 4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*
d*e*x^2 + 9*e^2*x^4)))*ArcSin[c*x] + 225*b^2*c^5*x*(15*d^2 + 10*d*e*x^2 + 3
*e^2*x^4)*ArcSin[c*x]^2)/(3375*c^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 634 vs. $2(299) = 598$.
time = 0.15, size = 635, normalized size = 1.90

method	result

derivativedivides	$\frac{\frac{a^2\left(d^2c^5x+\frac{2}{3}d\,c^5e\,x^3+\frac{1}{5}e^2c^5x^5\right)}{c^4}+\frac{b^2\left(\frac{e^2\left(675\arcsin(cx)^2c^5x^5+270\arcsin(cx)\sqrt{-c^2x^2+1}\,c^4x^4-2250c^3x^3\arcsin(cx)^2-54c^5\right.}{}\right.}{}}{}$
default	$\frac{\frac{a^2\left(d^2c^5x+\frac{2}{3}d\,c^5e\,x^3+\frac{1}{5}e^2c^5x^5\right)}{c^4}+\frac{b^2\left(\frac{e^2\left(675\arcsin(cx)^2c^5x^5+270\arcsin(cx)\sqrt{-c^2x^2+1}\,c^4x^4-2250c^3x^3\arcsin(cx)^2-54c^5\right.}{}\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/c*(a^2/c^4*(d^2*c^5*x+2/3*d*c^5*e*x^3+1/5*e^2*c^5*x^5)+b^2/c^4*(1/3375*e^2*(675*arcsin(c*x)^2*c^5*x^5+270*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4-2250*c^3*x^3*arcsin(c*x)^2-54*c^5*x^5-1140*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2+3375*c*x*arcsin(c*x)^2+380*c^3*x^3+4470*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-4470*c*x)+2/27*c^2*d*e*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*c*x*arcsin(c*x)^2-2*c^3*x^3-42*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+2/27*e^2*(9*c^3*x^3*arcsin(c*x)^2+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*c*x*arcsin(c*x)^2-2*c^3*x^3-42*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+c^4*d^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+2*c^2*d*e*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+e^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)))+2*a*b/c^4*(arcsin(c*x)*d^2*c^5*x+2/3*arcsin(c*x)*d*c^5*e*x^3+1/5*arcsin(c*x)*e^2*c^5*x^5+d^2*c^4*(-c^2*x^2+1)^(1/2)-2/3*d*c^2*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-1/5*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))))

Maxima [A]

time = 0.54, size = 437, normalized size = 1.30

$$\frac{1}{5}b^2x^5\arcsin(cx)^2e^2+\frac{2}{3}b^2dx^3\arcsin(cx)^2e+\frac{1}{5}a^2x^5e^2+b^2d^2x\arcsin(cx)^2+\frac{2}{3}a^2dx^3e-2b^2d^2\left(x-\frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right)+a^2d^2x+\frac{4}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abde+\frac{4}{27}\left(3c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx)-\frac{c^2x^3+6x}{c^2}\right)b^2de+\frac{2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)abd^2}{c}+\frac{2}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abe^2+\frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}\,x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}\,x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx)-\frac{9c^4x^5+20c^2x^3+120x}{c^4}\right)b^2e^2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] 1/5*b^2*x^5*arcsin(c*x)^2*e^2 + 2/3*b^2*d*x^3*arcsin(c*x)^2*e + 1/5*a^2*x^5*e^2 + b^2*d^2*x*arcsin(c*x)^2 + 2/3*a^2*d*x^3*e - 2*b^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^2*x + 4/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d*e + 4/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2*d*e + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^2/c + 2/7

```
5*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1
)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*e^2 + 2/1125*(15*(3*sqrt(-c^2*
x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)
*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*e^2
```

Fricas [A]
time = 2.30, size = 342, normalized size = 1.02

$$\frac{3375\,(a^2-2\,b^2)c^5d^2x+225\,(3\,b^2c^5x^5e^2+10\,b^2c^5dx^3e+15\,b^2c^5d^2x)\arcsin(cx)^2+450\,(3\,abc^5x^5e^2+10\,abc^5dx^3e+15\,abc^5d^2x)\arcsin(cx)+3\,(9\,(25\,a^2-2\,b^2)c^5x^5-40\,b^2c^3x^3-240\,b^2cx)e^2+250\,((9\,a^2-2\,b^2)c^5dx^3-12\,b^2c^3dx)e+30\,(225\,abc^4d^2+(225\,b^2c^4d^2+3\,(3\,b^2c^4x^4+4\,b^2c^2x^2+8\,b^2)e^2+50\,(b^2c^4dx^2+2\,b^2c^2d)e)\arcsin(cx)+3\,(3\,abc^4x^4+4\,abc^2x^2+8\,ab)e^2+50\,(abc^4dx^2+2\,abc^2d)e)\sqrt{-c^2x^2+1}}{3375\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/3375*(3375*(a^2 - 2*b^2)*c^5*d^2*x + 225*(3*b^2*c^5*x^5*e^2 + 10*b^2*c^5*
d*x^3*e + 15*b^2*c^5*d^2*x)*arcsin(c*x)^2 + 450*(3*a*b*c^5*x^5*e^2 + 10*a*b
*c^5*d*x^3*e + 15*a*b*c^5*d^2*x)*arcsin(c*x) + 3*(9*(25*a^2 - 2*b^2)*c^5*x^
5 - 40*b^2*c^3*x^3 - 240*b^2*c*x)*e^2 + 250*((9*a^2 - 2*b^2)*c^5*d*x^3 - 12
*b^2*c^3*d*x)*e + 30*(225*a*b*c^4*d^2 + (225*b^2*c^4*d^2 + 3*(3*b^2*c^4*x^4
 + 4*b^2*c^2*x^2 + 8*b^2)*e^2 + 50*(b^2*c^4*d*x^2 + 2*b^2*c^2*d)*e)*arcsin(
c*x) + 3*(3*a*b*c^4*x^4 + 4*a*b*c^2*x^2 + 8*a*b)*e^2 + 50*(a*b*c^4*d*x^2 +
2*a*b*c^2*d)*e)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A]
time = 0.71, size = 595, normalized size = 1.78

$$\begin{cases} a^2d^2x+\frac{2a^2dex^3}{3}+\frac{a^2e^2x^5}{5}+2abd^2x\,\mathrm{asin}(cx)+\frac{4abdex^3\,\mathrm{asin}(cx)}{3}+\frac{2abe^2x^5\,\mathrm{asin}(cx)}{5}+\frac{2abd^2\sqrt{-c^2x^2+1}}{c}+\frac{4abdex^2\sqrt{-c^2x^2+1}}{9c}+\frac{2abe^2x^4\sqrt{-c^2x^2+1}}{25c}+\frac{8abde\sqrt{-c^2x^2+1}}{9c^3}+\frac{8abe^2x^2\sqrt{-c^2x^2+1}}{75c^3}+\frac{16abe^2\sqrt{-c^2x^2+1}}{75c^5}+b^2d^2x\,\mathrm{asin}^2(cx)-2b^2d^2x+\frac{2b^2dex^3\,\mathrm{asin}^2(cx)}{3}-\frac{4b^2dex^3}{27}+\frac{b^2e^2x^5\,\mathrm{asin}^2(cx)}{5}-\frac{2b^2e^2x^5}{125}+\frac{2b^2d^2\sqrt{-c^2x^2+1}\,\mathrm{asin}(cx)}{c}+\frac{4b^2dex^2\sqrt{-c^2x^2+1}\,\mathrm{asin}(cx)}{9c}+\frac{2b^2e^2x^4\sqrt{-c^2x^2+1}\,\mathrm{asin}(cx)}{25c}-\frac{8b^2dex}{9c^2}-\frac{8b^2e^2x^3}{225c^2}+\frac{8b^2de\sqrt{-c^2x^2+1}\,\mathrm{asin}(cx)}{9c^3}+\frac{8b^2e^2x^2\sqrt{-c^2x^2+1}\,\mathrm{asin}(cx)}{75c^3}-\frac{16b^2e^2x}{75c^4}+\frac{16b^2e^2\sqrt{-c^2x^2+1}\,\mathrm{asin}(cx)}{75c^5} & \text{for}\ c\neq 0 \\ a^2\left(d^2x+\frac{2dex^3}{3}+\frac{e^2x^5}{5}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**2*x + 2*a**2*d*e*x**3/3 + a**2*e**2*x**5/5 + 2*a*b*d**2*
x*asin(c*x) + 4*a*b*d*e*x**3*asin(c*x)/3 + 2*a*b*e**2*x**5*asin(c*x)/5 + 2*
a*b*d**2*sqrt(-c**2*x**2 + 1)/c + 4*a*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c)
 + 2*a*b*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 8*a*b*d*e*sqrt(-c**2*x**2
+ 1)/(9*c**3) + 8*a*b*e**2*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 16*a*b*e**
2*sqrt(-c**2*x**2 + 1)/(75*c**5) + b**2*d**2*x*asin(c*x)**2 - 2*b**2*d**2*x
 + 2*b**2*d*e*x**3*asin(c*x)**2/3 - 4*b**2*d*e*x**3/27 + b**2*e**2*x**5*asi
n(c*x)**2/5 - 2*b**2*e**2*x**5/125 + 2*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(
c*x)/c + 4*b**2*d*e*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c) + 2*b**2*e**2
*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) - 8*b**2*d*e*x/(9*c**2) - 8*b**
2*e**2*x**3/(225*c**2) + 8*b**2*d*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3)
 + 8*b**2*e**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**3) - 16*b**2*e**2
*x/(75*c**4) + 16*b**2*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**5), Ne(c,
 0)), (a**2*(d**2*x + 2*d*e*x**3/3 + e**2*x**5/5), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 683 vs. 2(299) = 598.
time = 0.43, size = 683, normalized size = 2.04

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/5*a^2*e^2*x^5 + 2/3*a^2*d*e*x^3 + b^2*d^2*x*arcsin(c*x)^2 + 2*a*b*d^2*x*a
rcsin(c*x) + 2/3*(c^2*x^2 - 1)*b^2*d*e*x*arcsin(c*x)^2/c^2 + a^2*d^2*x - 2*
b^2*d^2*x + 4/3*(c^2*x^2 - 1)*a*b*d*e*x*arcsin(c*x)/c^2 + 2/3*b^2*d*e*x*arc
sin(c*x)^2/c^2 + 1/5*(c^2*x^2 - 1)^2*b^2*e^2*x*arcsin(c*x)^2/c^4 + 2*sqrt(-
c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c - 4/27*(c^2*x^2 - 1)*b^2*d*e*x/c^2 + 4/3
*a*b*d*e*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*a*b*e^2*x*arcsin(c*x)/c^4
+ 2/5*(c^2*x^2 - 1)*b^2*e^2*x*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^2 + 1)*a*b*
d^2/c - 4/9*(-c^2*x^2 + 1)^(3/2)*b^2*d*e*arcsin(c*x)/c^3 - 28/27*b^2*d*e*x/
c^2 - 2/125*(c^2*x^2 - 1)^2*b^2*e^2*x/c^4 + 4/5*(c^2*x^2 - 1)*a*b*e^2*x*arc
sin(c*x)/c^4 + 1/5*b^2*e^2*x*arcsin(c*x)^2/c^4 - 4/9*(-c^2*x^2 + 1)^(3/2)*a
*b*d*e/c^3 + 4/3*sqrt(-c^2*x^2 + 1)*b^2*d*e*arcsin(c*x)/c^3 + 2/25*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*e^2*arcsin(c*x)/c^5 - 76/1125*(c^2*x^2 - 1)*
b^2*e^2*x/c^4 + 2/5*a*b*e^2*x*arcsin(c*x)/c^4 + 4/3*sqrt(-c^2*x^2 + 1)*a*b*
d*e/c^3 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^5 - 4/15*(-c^2*
x^2 + 1)^(3/2)*b^2*e^2*arcsin(c*x)/c^5 - 298/1125*b^2*e^2*x/c^4 - 4/15*(-c^
2*x^2 + 1)^(3/2)*a*b*e^2/c^5 + 2/5*sqrt(-c^2*x^2 + 1)*b^2*e^2*arcsin(c*x)/c
^5 + 2/5*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^5
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\left(e\,x^2+d\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x^2)^2, x)
```

3.661 $\int (d+ex^2) (a+b\textbf{ArcSin}(cx))^2 \, dx$

Optimal. Leaf size=156

$$-2b^2dx-\frac{4b^2ex}{9c^2}-\frac{2}{27}b^2ex^3+\frac{2bd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c}+\frac{4be\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^3}+\frac{2bex^2\sqrt{1}}{}$$

```
[Out] -2*b^2*d*x-4/9*b^2*e*x/c^2-2/27*b^2*e*x^3+d*x*(a+b*arcsin(c*x))^2+1/3*e*x^3
*(a+b*arcsin(c*x))^2+2*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+4/9*b*e*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+2/9*b*e*x^2*(a+b*arcsin(c*x))*(-c^2
*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.19, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {4757, 4715, 4767, 8, 4723, 4795, 30}

$$\frac{2bd\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c}+\frac{2bex^2\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c}+\frac{4be\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{9c^3}+dx(a+b\text{ArcSin}(cx))^2+\frac{1}{3}ex^3(a+b\text{ArcSin}(cx))^2-\frac{4b^2ex}{9c^2}-2b^2dx-\frac{2}{27}b^2ex^3$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d*x - (4*b^2*e*x)/(9*c^2) - (2*b^2*e*x^3)/27 + (2*b*d*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/c + (4*b*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(9*c^3) + (2*b*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + d*x*(a
+ b*ArcSin[c*x])^2 + (e*x^3*(a + b*ArcSin[c*x])^2)/3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
```

```
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)\left(a+b\sin^{-1}(cx)\right)^2\,dx = \int \left(d\left(a+b\sin^{-1}(cx)\right)^2+ex^2\left(a+b\sin^{-1}(cx)\right)^2\right)\,dx$$

$$= d\int \left(a+b\sin^{-1}(cx)\right)^2\,dx+e\int x^2\left(a+b\sin^{-1}(cx)\right)^2\,dx$$

$$= dx\left(a+b\sin^{-1}(cx)\right)^2+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)^2-(2bcd)\int \frac{x\left(a+b\sin^{-1}\right.}{\sqrt{1-c^2}}$$

$$= \frac{2bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{2bex^2\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{9c}+$$

$$= -2b^2dx-\frac{2}{27}b^2ex^3+\frac{2bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{4be\sqrt{1-c^2x^2}}{9}$$

$$= -2b^2dx-\frac{4b^2ex}{9c^2}-\frac{2}{27}b^2ex^3+\frac{2bd\sqrt{1-c^2x^2}\left(a+b\sin^{-1}(cx)\right)}{c}+\frac{4be\sqrt{}}{}$$

Mathematica [A]

time = 0.13, size = 166, normalized size = 1.06

$$\frac{9a^2c^3x(3d+ex^2)+6ab\sqrt{1-c^2x^2}\,(2e+c^2(9d+ex^2))-2b^2cx(6e+c^2(27d+ex^2))+6b\left(3ac^3x(3d+ex^2)+b\sqrt{1-c^2x^2}\,(2e+c^2(9d+ex^2))\right)\text{ArcSin}(cx)+9b^2c^3x(3d+ex^2)\,\text{ArcSin}(cx)^2}{27c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (9*a^2*c^3*x*(3*d + e*x^2) + 6*a*b*Sqrt[1 - c^2*x^2]*(2*e + c^2*(9*d + e*x^
2)) - 2*b^2*c*x*(6*e + c^2*(27*d + e*x^2)) + 6*b*(3*a*c^3*x*(3*d + e*x^2) +
 b*Sqrt[1 - c^2*x^2]*(2*e + c^2*(9*d + e*x^2)))*ArcSin[c*x] + 9*b^2*c^3*x*(
3*d + e*x^2)*ArcSin[c*x]^2)/(27*c^3)
```

Maple [A]

time = 0.09, size = 276, normalized size = 1.77

method	result
derivativedivides	$\frac{a^2\left(d\,c^3x+\frac{1}{3}e\,c^3x^3\right)}{c^2}+\frac{b^2\left(\frac{e\left(9c^3x^3\arcsin(cx)^2+6\arcsin(cx)\sqrt{-c^2x^2+1}\,c^2x^2-27cx\arcsin(cx)^2-2c^3x^3-42\arcsin(cx)\sqrt{-\cdots}\right.}{27}\right.}{\cdots}$
default	$\frac{a^2\left(d\,c^3x+\frac{1}{3}e\,c^3x^3\right)}{c^2}+\frac{b^2\left(\frac{e\left(9c^3x^3\arcsin(cx)^2+6\arcsin(cx)\sqrt{-c^2x^2+1}\,c^2x^2-27cx\arcsin(cx)^2-2c^3x^3-42\arcsin(cx)\sqrt{-\cdots}\right.}{27}\right.}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2/c^2*(d*c^3*x+1/3*e*c^3*x^3)+b^2/c^2*(1/27*e*(9*c^3*x^3*arcsin(c*x)
^2+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-27*c*x*arcsin(c*x)^2-2*c^3*x^3-
42*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+42*c*x)+d*c^2*(c*x*arcsin(c*x)^2-2*c*x+2*
arcsin(c*x)*(-c^2*x^2+1)^(1/2))+e*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)))+2*a*b/c^2*(arcsin(c*x)*d*c^3*x+1/3*arcsin(c*x)*e*c^3*x^3
+d*c^2*(-c^2*x^2+1)^(1/2)-1/3*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*
x^2+1)^(1/2))))
```

Maxima [A]

time = 0.56, size = 225, normalized size = 1.44

$$\frac{1}{3}b^2x^3\arcsin(cx)^2e+b^2dx\arcsin(cx)^2+\frac{1}{3}a^2x^3e-2b^2d\left(x-\frac{\sqrt{-c^2x^2+1}\,\arcsin(cx)}{c}\right)+a^2dx+\frac{2}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abe+\frac{2}{27}\left(3c\left(\frac{\sqrt{-c^2x^2+1}\,x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx)-\frac{c^2x^3+6x}{c^2}\right)b^2e+\frac{2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)abd}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*x^3*arcsin(c*x)^2*e + b^2*d*x*arcsin(c*x)^2 + 1/3*a^2*x^3*e - 2*b^2
*d*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*x + 2/9*(3*x^3*arcsin(c*x
) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*e + 2/27
*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) -
 (c^2*x^3 + 6*x)/c^2)*b^2*e + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*
d/c
```

Fricas [A]
time = 2.67, size = 183, normalized size = 1.17

$$\frac{27\,(a^2-2\,b^2)c^3dx+9\,(b^2c^3x^3e+3\,b^2c^3dx)\arcsin\,(cx)^2+18\,(abc^3x^3e+3\,abc^3dx)\arcsin\,(cx)+((9\,a^2-2\,b^2)c^3x^3-12\,b^2cx)e+6\,(9\,abc^2d+(9\,b^2c^2d+(b^2c^2x^2+2\,b^2)e)\arcsin\,(cx)+(abc^2x^2+2\,ab)e)\sqrt{-c^2x^2+1}}{27\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27*(27*(a^2 - 2*b^2)*c^3*d*x + 9*(b^2*c^3*x^3*e + 3*b^2*c^3*d*x)*arcsin(c
*x)^2 + 18*(a*b*c^3*x^3*e + 3*a*b*c^3*d*x)*arcsin(c*x) + ((9*a^2 - 2*b^2)*c
^3*x^3 - 12*b^2*c*x)*e + 6*(9*a*b*c^2*d + (9*b^2*c^2*d + (b^2*c^2*x^2 + 2*b
^2)*e)*arcsin(c*x) + (a*b*c^2*x^2 + 2*a*b)*e)*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A]
time = 0.36, size = 279, normalized size = 1.79

$$\begin{cases} a^2dx+\frac{a^2ex^3}{3}+2abdx\,\text{asin}\,(cx)+\frac{2abex^3\,\text{asin}\,(cx)}{3}+\frac{2abd\sqrt{-c^2x^2+1}}{c}+\frac{2abex^2\sqrt{-c^2x^2+1}}{9c}+\frac{4abe\sqrt{-c^2x^2+1}}{9c^3}+b^2dx\,\text{asin}^2\,(cx)-2b^2dx+\frac{b^2ex^3\,\text{asin}^2\,(cx)}{3}-\frac{2b^2ex^3}{27}+\frac{2b^2d\sqrt{-c^2x^2+1}\,\text{asin}\,(cx)}{c}+\frac{2b^2ex^2\sqrt{-c^2x^2+1}\,\text{asin}\,(cx)}{9c}-\frac{4b^2ex}{9c^2}+\frac{4b^2e\sqrt{-c^2x^2+1}\,\text{asin}\,(cx)}{9c^3} & \text{for}\; c\neq 0 \\ a^2\left(dx+\frac{ex^3}{3}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*x + a**2*e*x**3/3 + 2*a*b*d*x*asin(c*x) + 2*a*b*e*x**3*as
in(c*x)/3 + 2*a*b*d*sqrt(-c**2*x**2 + 1)/c + 2*a*b*e*x**2*sqrt(-c**2*x**2 +
 1)/(9*c) + 4*a*b*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + b**2*d*x*asin(c*x)**2 -
 2*b**2*d*x + b**2*e*x**3*asin(c*x)**2/3 - 2*b**2*e*x**3/27 + 2*b**2*d*sqrt
(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*e*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)
/(9*c) - 4*b**2*e*x/(9*c**2) + 4*b**2*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c
**3), Ne(c, 0)), (a**2*(d*x + e*x**3/3), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 285 vs. $2(140) = 280$.
time = 0.41, size = 285, normalized size = 1.83

$$\frac{1}{3}\,a^2ex^3+b^2dx\arcsin\,(cx)^2+2\,abdx\arcsin\,(cx)+\frac{(c^2x^2-1)b^2ex\arcsin\,(cx)^2}{3\,c^2}+a^2dx-2\,b^2dx+\frac{2\,(c^2x^2-1)abex\arcsin\,(cx)}{3\,c^2}+\frac{b^2ex\arcsin\,(cx)^2}{3\,c^2}+\frac{2\,\sqrt{-c^2x^2+1}\,b^2d\arcsin\,(cx)}{c}-\frac{2\,(c^2x^2-1)b^2ex}{27\,c^2}+\frac{2\,abex\arcsin\,(cx)}{3\,c^2}+\frac{2\,\sqrt{-c^2x^2+1}\,abd}{c}-\frac{2\,(-c^2x^2+1)^{\frac{3}{2}}b^2e\arcsin\,(cx)}{9\,c^3}-\frac{14\,b^2ex}{27\,c^2}-\frac{2\,(-c^2x^2+1)^{\frac{3}{2}}abe}{9\,c^3}+\frac{2\,\sqrt{-c^2x^2+1}\,b^2e\arcsin\,(cx)}{3\,c^3}+\frac{2\,\sqrt{-c^2x^2+1}\,abe}{3\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/3*a^2*e*x^3 + b^2*d*x*arcsin(c*x)^2 + 2*a*b*d*x*arcsin(c*x) + 1/3*(c^2*x^
2 - 1)*b^2*e*x*arcsin(c*x)^2/c^2 + a^2*d*x - 2*b^2*d*x + 2/3*(c^2*x^2 - 1)*
a*b*e*x*arcsin(c*x)/c^2 + 1/3*b^2*e*x*arcsin(c*x)^2/c^2 + 2*sqrt(-c^2*x^2 +
 1)*b^2*d*arcsin(c*x)/c - 2/27*(c^2*x^2 - 1)*b^2*e*x/c^2 + 2/3*a*b*e*x*arcs
in(c*x)/c^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d/c - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*e
*arcsin(c*x)/c^3 - 14/27*b^2*e*x/c^2 - 2/9*(-c^2*x^2 + 1)^(3/2)*a*b*e/c^3 +
 2/3*sqrt(-c^2*x^2 + 1)*b^2*e*arcsin(c*x)/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*
e/c^3
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\,\mathrm{asin}(c\,x))^2\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x^2), x)
```

3.662 $\int (a+b\mathbf{ArcSin}(cx))^2\,dx$

Optimal. Leaf size=47

$$-2b^2x+\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c}+x(a+b\text{ArcSin}(cx))^2$$

```
[Out] -2*b^2*x+x*(a+b*arcsin(c*x))^2+2*b*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A]
time = 0.04, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}=0.300$, Rules used = {4715, 4767, 8}

$$\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c}+x(a+b\text{ArcSin}(cx))^2-2b^2x$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(a+b\sin^{-1}(cx)\right)^2\,dx = x\left(a+b\sin^{-1}(cx)\right)^2-(2bc)\int \frac{x(a+b\sin^{-1}(cx))}{\sqrt{1-c^2x^2}}\,dx$$
$$= \frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c}+x\left(a+b\sin^{-1}(cx)\right)^2-\left(2b^2\right)\int 1\,dx$$
$$= -2b^2x+\frac{2b\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}{c}+x\left(a+b\sin^{-1}(cx)\right)^2$$

Mathematica [A]
time = 0.03, size = 47, normalized size = 1.00

$$-2b^2x+\frac{2b\sqrt{1-c^2x^2}\,(a+b\text{ArcSin}(cx))}{c}+x(a+b\text{ArcSin}(cx))^2$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Maple [A]
time = 0.07, size = 72, normalized size = 1.53

method	result	size
derivativedivides	$\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	72
default	$\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	72

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(c*x*a^2+b^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))
+2*a*b*(c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)))
```

Maxima [A]
time = 0.47, size = 72, normalized size = 1.53

$$b^2x\arcsin\left(cx\right)^2-2\,b^2\left(x-\frac{\sqrt{-c^2x^2+1}\,\arcsin\left(cx\right)}{c}\right)+a^2x+\frac{2\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)ab}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] b^2*x*arcsin(c*x)^2 - 2*b^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*x
+ 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b/c
```

Fricas [A]
time = 2.83, size = 65, normalized size = 1.38

$$\frac{b^2cx\arcsin(cx)^2+2\,abcx\arcsin(cx)+(a^2-2\,b^2)cx+2\,\sqrt{-c^2x^2+1}\,(b^2\arcsin(cx)+ab)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] (b^2*c*x*arcsin(c*x)^2 + 2*a*b*c*x*arcsin(c*x) + (a^2 - 2*b^2)*c*x + 2*sqrt
(-c^2*x^2 + 1)*(b^2*arcsin(c*x) + a*b))/c
```

Sympy [A]
time = 0.10, size = 82, normalized size = 1.74

$$\begin{cases} a^2x+2abx\operatorname{asin}(cx)+\frac{2ab\sqrt{-c^2x^2+1}}{c}+b^2x\operatorname{asin}^2(cx)-2b^2x+\frac{2b^2\sqrt{-c^2x^2+1}\operatorname{asin}(cx)}{c} & \text{for}\ c\neq 0\\ a^2x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*x + 2*a*b*x*asin(c*x) + 2*a*b*sqrt(-c**2*x**2 + 1)/c + b**2
*x*asin(c*x)**2 - 2*b**2*x + 2*b**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c, Ne(c,
 0)), (a**2*x, True))
```

Giac [A]
time = 0.43, size = 75, normalized size = 1.60

$$b^2x\arcsin(cx)^2+2\,abx\arcsin(cx)+a^2x-2\,b^2x+\frac{2\,\sqrt{-c^2x^2+1}\,b^2\arcsin(cx)}{c}+\frac{2\,\sqrt{-c^2x^2+1}\,ab}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x - 2*b^2*x + 2*sqrt(-c^2*x
^2 + 1)*b^2*arcsin(c*x)/c + 2*sqrt(-c^2*x^2 + 1)*a*b/c
```

Mupad [B]
time = 0.53, size = 142, normalized size = 3.02

$$\begin{cases} b^2\left(x\left(\operatorname{asin}(c\,x)^2-2\right)+2\operatorname{asin}(c\,x)\,\sqrt{\frac{1}{c^2}-x^2}\right)+a^2\,x+\frac{2\,a\,b\left(\sqrt{1-c^2\,x^2}+c\,x\operatorname{asin}(c\,x)\right)}{c} & \text{if}\ \ 0<c\\ a^2\,x+b^2\,x\left(\operatorname{asin}(c\,x)^2-2\right)+\frac{2\,b^2\operatorname{asin}(c\,x)\,\sqrt{1-c^2\,x^2}}{c}+\frac{2\,a\,b\left(\sqrt{1-c^2\,x^2}+c\,x\operatorname{asin}(c\,x)\right)}{c} & \text{if}\ \ \neg 0<c \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2,x)
```

```
[Out] piecewise(0 < c, b^2*(x*(asin(c*x)^2 - 2) + 2*asin(c*x)*(1/c^2 - x^2)^(1/2)
) + a^2*x + (2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c, ~0 < c, a^2*
x + b^2*x*(asin(c*x)^2 - 2) + (2*b^2*asin(c*x)*(- c^2*x^2 + 1)^(1/2))/c + (
2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c)
```

3.663 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{d+ex^2}\,dx$

Optimal. Leaf size=821

$$\frac{(a+b\text{ArcSin}(cx))^2\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{(a+b\text{ArcSin}(cx))^2\log\left(1+\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}+\frac{(a+\cdots}{}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))^2*ln(1+(I*c
*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)
/e^(1/2)+1/2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I
*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))^2*
ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(
-d)^(1/2)/e^(1/2)+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-I*b*(a+b*ar
csin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^
2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(
1/2)-I*b*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*
c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-b^2*polylog(3,-(I*c*x+(-c
^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/
2)+b^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+
e)^(1/2)))/(-d)^(1/2)/e^(1/2)-b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(
1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)+b^2*polylog(3,(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2
)/e^(1/2)
```

Rubi [A]
time = 0.93, antiderivative size = 821, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used = {4757, 4825, 4617, 2221, 2611, 2320, 6724}

$$-\frac{\text{Li}_3\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\,\sqrt{e}}+\frac{\text{Li}_3\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\,\sqrt{e}}-\frac{\text{Li}_3\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\,\sqrt{e}}+\frac{\text{Li}_3\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\,\sqrt{e}}+\frac{i(a+b\text{ArcSin}(cx))\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\,\sqrt{e}}-\frac{i(a+b\text{ArcSin}(cx))\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\,\sqrt{e}}+\frac{i(a+b\text{ArcSin}(cx))\text{Li}_2\left(-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\,\sqrt{e}}-\frac{i(a+b\text{ArcSin}(cx))\text{Li}_2\left(\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\,\sqrt{e}}+\frac{(a+b\text{ArcSin}(cx))^2\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{(a+b\text{ArcSin}(cx))^2\log\left(\frac{e^{i\text{ArcSin}(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)}{2\sqrt{-d}\,\sqrt{e}}+\frac{(a+b\text{ArcSin}(cx))^2\log\left(1-\frac{\sqrt{e}\,e^{i\text{ArcSin}(cx)}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{(a+b\text{ArcSin}(cx))^2\log\left(\frac{e^{i\text{ArcSin}(cx)}\sqrt{e}}{i\sqrt{-d}\,c+\sqrt{dc^2+e}}+1\right)}{2\sqrt{-d}\,\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2),x]
```

```
[Out] ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*Log[1 + (S
qrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sq
rt[e]) + ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sq
```

```
rt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - (I*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sq
rt[e]) - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt
[e]) + (b^2*PolyLog[3, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2
*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) + (b^2*PolyLog[3,
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*S
qrt[e])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{d+ex^2}\,dx = \int \left(\frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))^2}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\sqrt{-d}\,(a+b\sin^{-1}(cx))^2}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx$$

$$= -\frac{\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2\sqrt{-d}} - \frac{\int \frac{(a+b\sin^{-1}(cx))^2}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2\sqrt{-d}}$$

$$= -\frac{\text{Subst}\left(\int \frac{(a+bx)^2\cos(x)}{c\sqrt{-d}-\sqrt{e}\,\sin(x)}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{\text{Subst}\left(\int \frac{(a+bx)^2\cos(x)}{c\sqrt{-d}+\sqrt{e}\,\sin(x)}\,dx, \ldots\right.}{2\sqrt{-d}}$$

$$= -\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}\,e^{ix}}\,dx, x, \sin^{-1}(cx)\right)}{2\sqrt{-d}} - \frac{i\text{Subst}\left(\int \frac{e \ldots}{ic\sqrt{-d}+\ldots}\right.}{\ldots}$$

$$= \frac{(a+b\sin^{-1}(cx))^2\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}} - \frac{(a+b\sin^{-1}(cx))^2\log\left(1+\ldots\right.}{2\sqrt{-d}\,\sqrt{\ldots}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}} - \frac{(a+b\sin^{-1}(cx))^2\log\left(1+\ldots\right.}{2\sqrt{-d}\,\sqrt{\ldots}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}} - \frac{(a+b\sin^{-1}(cx))^2\log\left(1+\ldots\right.}{2\sqrt{-d}\,\sqrt{\ldots}}$$

$$= \frac{(a+b\sin^{-1}(cx))^2\log\left(1-\frac{\sqrt{e}\,e^{i\sin^{-1}(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\,\sqrt{e}} - \frac{(a+b\sin^{-1}(cx))^2\log\left(1+\ldots\right.}{2\sqrt{-d}\,\sqrt{\ldots}}$$

Mathematica [A]
time = 0.53, size = 1101, normalized size = 1.34

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2),x]
```

```
[Out] (2*a^2*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - 2*a*b*Sqrt[d]*ArcSin[c*x]*Log
[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] - b^2*Sq
rt[d]*ArcSin[c*x]^2*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e])] + 2*a*b*Sqrt[d]*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
```

```
]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] + b^2*Sqrt[d]*ArcSin[c*x]^2*Log[1
+ (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] + 2*a*b*
Sqrt[d]*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqr
t[c^2*d + e])] + b^2*Sqrt[d]*ArcSin[c*x]^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - 2*a*b*Sqrt[d]*ArcSin[c*x]*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - b^2*Sqrt[d]*
ArcSin[c*x]^2*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*
d + e])] - (2*I)*b*Sqrt[d]*(a + b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + (2*I)*b*Sqrt[d]*(a + b*ArcSi
n[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*
d + e])] + (2*I)*a*b*Sqrt[d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] + Sqrt[c^2*d + e]))] + (2*I)*b^2*Sqrt[d]*ArcSin[c*x]*PolyLog[2, -(
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))] - (2*I)*a*b*
Sqrt[d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
 e])] - (2*I)*b^2*Sqrt[d]*ArcSin[c*x]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x])
)/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] + 2*b^2*Sqrt[d]*PolyLog[3, (Sqrt[e]*E^(
I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] - 2*b^2*Sqrt[d]*PolyLog[3
, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] - 2*b^2*
Sqrt[d]*PolyLog[3, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
 + e]))] + 2*b^2*Sqrt[d]*PolyLog[3, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d^2]*Sqrt[e])
```

Maple [F]
time = 1.09, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] a^2*arctan(x*e^(1/2)/sqrt(d))*e^(-1/2)/sqrt(d) + integrate((b^2*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)))/(x^2*e + d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(x^2*e + d), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}{(cx)})^2}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d),x)
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \operatorname{asin}(c\,x))^2}{e\,x^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2),x)
[Out] int((a + b*asin(c*x))^2/(d + e*x^2), x)
```

3.664 $\int \sqrt{d+ex^2} (a+b\mathbf{ArcSin}(cx))^2 dx$

Optimal. Leaf size=25

$$\text{Int}\left(\sqrt{d+ex^2} (a+b\text{ArcSin}(cx))^2, x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \sqrt{d+ex^2} (a+b\text{ArcSin}(cx))^2 dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \sqrt{d+ex^2} \left(a+b\sin^{-1}(cx)\right)^2 dx = \int \sqrt{d+ex^2} \left(a+b\sin^{-1}(cx)\right)^2 dx$$

Mathematica [A]
time = 10.73, size = 0, normalized size = 0.00

$$\int \sqrt{d+ex^2} (a+b\text{ArcSin}(cx))^2 dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 0.75, size = 0, normalized size = 0.00

$$\int \sqrt{e\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*(d*arcsinh(x*e^(1/2)/sqrt(d))*e^(-1/2) + sqrt(x^2*e + d)*x)*a^2 + integ
rate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(x^2*e + d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(x^2*e + d), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\operatorname{asin}(cx))^2\sqrt{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**2*sqrt(d + e*x**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int (a+b\operatorname{asin}(c\,x))^2\,\sqrt{e\,x^2+d}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))^2*(d + e*x^2)^(1/2), x)
```

3.665 $\int \frac{(a+b\mathbf{ArcSin}(cx))^2}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{d+ex^2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{d+ex^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2],x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}}\,dx=\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{\sqrt{d+ex^2}}\,dx$$

Mathematica [A]
time = 8.74, size = 0, normalized size = 0.00

$$\int \frac{(a+b\mathrm{ArcSin}(cx))^2}{\sqrt{d+ex^2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2],x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2], x]
```

Maple [A]
time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] a^2*arcsinh(x*e^(1/2)/sqrt(d))*e^(-1/2) + integrate((b^2*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)))/sqrt(x^2*e + d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/sqrt(x^2*e + d), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))^2}{\sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/sqrt(d + e*x**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/sqrt(e*x^2 + d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))^2/(d + e*x^2)^(1/2), x)
```

3.666 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{3/2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2),x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^2}{(d+ex^2)^{3/2}}\,dx = \int \frac{(a+b\sin^{-1}(cx))^2}{(d+ex^2)^{3/2}}\,dx$$

Mathematica [A]
time = 3.04, size = 0, normalized size = 0.00

$$\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2), x]
```

Maple [A]
time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^2}{(e\,x^2+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(c^2*d-%e>0)', see `assume?` for mor
e detai
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(x^2*e + d)/(x^4
*e^2 + 2*d*x^2*e + d^2), x)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}(cx))^2}{(d + ex^2)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2)**(3/2), x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d)^(3/2), x)
```

Mupad [A]

time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(e\,x^2+d)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d + e*x^2)^(3/2), x)
```

3.667 $\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{5/2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2),x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+ex^2)^{5/2}}\,dx = \int \frac{\left(a+b\sin^{-1}(cx)\right)^2}{(d+ex^2)^{5/2}}\,dx$$

Mathematica [A]
time = 6.92, size = 0, normalized size = 0.00

$$\int \frac{(a+b\text{ArcSin}(cx))^2}{(d+ex^2)^{5/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2),x]
```

```
[Out] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2), x]
```

Maple [A]
time = 0.71, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\arcsin\left(cx\right)\right)^2}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a^2*(2*x/(sqrt(x^2*e + d)*d^2) + x/((x^2*e + d)^(3/2)*d)) + integrate((
b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)))*sqrt(x^2*e + d)/(x^6*e^3 + 3*d*x^4*e^2 + 3*d^2*x^
2*e + d^3), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(x^2*e + d)/(x^6
*e^3 + 3*d*x^4*e^2 + 3*d^2*x^2*e + d^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\operatorname{asin}(cx))^2}{(d+ex^2)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2)**(5/2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d)^(5/2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(e\,x^2+d\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2)^(5/2),x)
[Out] int((a + b*asin(c*x))^2/(d + e*x^2)^(5/2), x)
```

3.668 $\int \frac{(d+ex^2)^2}{a+b\textbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=387

$$\frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}+\frac{de\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{2bc^3}+\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+bA\cdots}{\cdots}\right)}{8bc^5}$$

```
[Out] d^2*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+1/2*d*e*Ci((a+b*arcsin(c*x))/b)*co
s(a/b)/b/c^3+1/8*e^2*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c^5-1/2*d*e*Ci(3*(a
+b*arcsin(c*x))/b)*cos(3*a/b)/b/c^3-3/16*e^2*Ci(3*(a+b*arcsin(c*x))/b)*cos(
3*a/b)/b/c^5+1/16*e^2*Ci(5*(a+b*arcsin(c*x))/b)*cos(5*a/b)/b/c^5+d^2*Si((a+
b*arcsin(c*x))/b)*sin(a/b)/b/c+1/2*d*e*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
^3+1/8*e^2*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^5-1/2*d*e*Si(3*(a+b*arcsin(
c*x))/b)*sin(3*a/b)/b/c^3-3/16*e^2*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c
^5+1/16*e^2*Si(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^5
```

Rubi [A]
time = 0.53, antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used = {4757, 4719, 3384, 3380, 3383, 4731, 4491}

$$\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^5}-\frac{3e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^5}+\frac{e^2\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^5}+\frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8bc^5}-\frac{3e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^5}+\frac{e^2\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16bc^5}+\frac{de\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{2bc^3}-\frac{de\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^3}+\frac{de\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{2bc^3}-\frac{de\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{2bc^3}+\frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}+\frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (d*e*Cos[a/b]*Cos
Integral[(a + b*ArcSin[c*x])/b])/(2*b*c^3) + (e^2*Cos[a/b]*CosIntegral[(a +
 b*ArcSin[c*x])/b])/(8*b*c^5) - (d*e*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(2*b*c^3) - (3*e^2*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin
[c*x]))/b])/(16*b*c^5) + (e^2*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x
]))/b])/(16*b*c^5) + (d^2*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b*c
) + (d*e*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(2*b*c^3) + (e^2*Sin[
a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b*c^5) - (d*e*Sin[(3*a)/b]*SinI
ntegral[(3*(a + b*ArcSin[c*x]))/b])/(2*b*c^3) - (3*e^2*Sin[(3*a)/b]*SinInte
gral[(3*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (e^2*Sin[(5*a)/b]*SinIntegral
[(5*(a + b*ArcSin[c*x]))/b])/(16*b*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$\int \frac{(d+ex^2)^2}{a+b\sin^{-1}(cx)}\,dx = \int \left(\frac{d^2}{a+b\sin^{-1}(cx)} + \frac{2dex^2}{a+b\sin^{-1}(cx)} + \frac{e^2x^4}{a+b\sin^{-1}(cx)}\right) dx$$

$$= d^2\int \frac{1}{a+b\sin^{-1}(cx)}\,dx + (2de)\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx + e^2\int \frac{x^4}{a+b\sin^{-1}(cx)}\,dx$$

$$= \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{(2de)\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(c\right.}{c^3}$$

$$= \frac{(2de)\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)} - \frac{\cos(3x)}{4(a+bx)}\right) dx, x, \sin^{-1}(cx)\right)}{c^3} + \frac{e^2\text{Subst}\left(\int \left(\frac{\cos(x)}{8(a+bx)} - \frac{3\cos(3x)}{16(a+bx)}\right.\right.}{c}$$

$$= \frac{d^2\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{(de)\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \text{s}\right.}{2c^3}$$

$$= \frac{d^2\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{\left(de\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos(\ldots)}{a+\ldots}\right.}{2c^3}$$

$$= \frac{de\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{2bc^3} + \frac{e^2\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{8bc^5} - \frac{de\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\right.}{2bc^3}$$

Mathematica [A]
time = 0.38, size = 253, normalized size = 0.65

$$\frac{2(8c^4d^2+4c^2de+e^2)\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) - e(8c^2d+3e)\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + e^2\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + 16c^4d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + 8c^2de\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + 2e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) - 8c^2de\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) - 3e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + e^2\sin\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16bc^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*(8*c^4*d^2 + 4*c^2*d*e + e^2)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] -
e*(8*c^2*d + 3*e)*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + e^2*Cos
[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 16*c^4*d^2*Sin[a/b]*SinInteg
ral[a/b + ArcSin[c*x]] + 8*c^2*d*e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]]
+ 2*e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - 8*c^2*d*e*Sin[(3*a)/b]*Si
nIntegral[3*(a/b + ArcSin[c*x])] - 3*e^2*Sin[(3*a)/b]*SinIntegral[3*(a/b +
ArcSin[c*x])] + e^2*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*
c^5)
```

Maple [A]
time = 0.18, size = 310, normalized size = 0.80

method	result
derivativedivides	$\frac{16\,\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^4d^2+16\,\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^4d^2-8\,\text{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)\ldots}{}$

default	$\frac{16\,\mathrm{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^4d^2+16\,\mathrm{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^4d^2-8\,\mathrm{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e*x^2+d)^2/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/16/c^5*(16*Si(arcsin(c*x)+a/b)*sin(a/b)*c^4*d^2+16*Ci(arcsin(c*x)+a/b)*cos(a/b)*c^4*d^2-8*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*c^2*d*e-8*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*c^2*d*e+8*Si(arcsin(c*x)+a/b)*sin(a/b)*c^2*d*e+8*Ci(arcsin(c*x)+a/b)*cos(a/b)*c^2*d*e+sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*e^2+cos(5*a/b)*Ci(5*arcsin(c*x)+5*a/b)*e^2-3*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*e^2-3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*e^2+2*Si(arcsin(c*x)+a/b)*sin(a/b)*e^2+2*Ci(arcsin(c*x)+a/b)*cos(a/b)*e^2)/b

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate((x^2*e + d)^2/(b*arcsin(c*x) + a), x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral((x^4*e^2 + 2*d*x^2*e + d^2)/(b*arcsin(c*x) + a), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(d+ex^2)^2}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x**2+d)**2/(a+b*asin(c*x)),x)

[Out] Integral((d + e*x**2)**2/(a + b*asin(c*x)), x)

Giac [A]
time = 0.47, size = 633, normalized size = 1.64

$$\frac{e^{2} \cos\left(\frac{a}{b}\right)^{5} \operatorname{Ci}\left(\frac{5 a}{b} + 5 \arcsin\left(c x\right)\right)}{b c^{5}} - \frac{2 d e \cos\left(\frac{a}{b}\right)^{3} \operatorname{Ci}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{b c^{3}} + \frac{d^{2} \cos\left(\frac{a}{b}\right) \operatorname{Ci}\left(\frac{a}{b} + \arcsin\left(c x\right)\right)}{b c} + \frac{e^{2} \cos\left(\frac{a}{b}\right)^{4} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{5 a}{b} + 5 \arcsin\left(c x\right)\right)}{b c^{5}} - \frac{2 d e \cos\left(\frac{a}{b}\right)^{2} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{b c^{3}} + \frac{d^{2} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{a}{b} + \arcsin\left(c x\right)\right)}{b c} - \frac{5 e^{2} \cos\left(\frac{a}{b}\right)^{3} \operatorname{Ci}\left(\frac{5 a}{b} + 5 \arcsin\left(c x\right)\right)}{4 b c^{5}} + \frac{3 d e \cos\left(\frac{a}{b}\right) \operatorname{Ci}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{2 b c^{3}} - \frac{3 e^{2} \cos\left(\frac{a}{b}\right)^{3} \operatorname{Ci}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{4 b c^{5}} + \frac{d e \cos\left(\frac{a}{b}\right) \operatorname{Ci}\left(\frac{a}{b} + \arcsin\left(c x\right)\right)}{2 b c^{3}} - \frac{3 e^{2} \cos\left(\frac{a}{b}\right)^{2} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{5 a}{b} + 5 \arcsin\left(c x\right)\right)}{4 b c^{5}} + \frac{d e \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{2 b c^{3}} - \frac{3 e^{2} \cos\left(\frac{a}{b}\right)^{2} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{4 b c^{5}} + \frac{d e \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{a}{b} + \arcsin\left(c x\right)\right)}{2 b c^{3}} + \frac{5 e^{2} \cos\left(\frac{a}{b}\right) \operatorname{Ci}\left(\frac{5 a}{b} + 5 \arcsin\left(c x\right)\right)}{16 b c^{5}} + \frac{9 e^{2} \cos\left(\frac{a}{b}\right) \operatorname{Ci}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{16 b c^{5}} + \frac{e^{2} \cos\left(\frac{a}{b}\right) \operatorname{Ci}\left(\frac{a}{b} + \arcsin\left(c x\right)\right)}{8 b c^{5}} + \frac{e^{2} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{5 a}{b} + 5 \arcsin\left(c x\right)\right)}{16 b c^{5}} + \frac{3 e^{2} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{3 a}{b} + 3 \arcsin\left(c x\right)\right)}{16 b c^{5}} + \frac{e^{2} \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{a}{b} + \arcsin\left(c x\right)\right)}{8 b c^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] e^2*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) - 2*d*e*cos(a/b)
^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^2*cos(a/b)*cos_integral(
a/b + arcsin(c*x))/(b*c) + e^2*cos(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*a
rcsin(c*x))/(b*c^5) - 2*d*e*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcs
in(c*x))/(b*c^3) + d^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) - 5/4
*e^2*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) + 3/2*d*e*cos(a
/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) - 3/4*e^2*cos(a/b)^3*cos_in
tegral(3*a/b + 3*arcsin(c*x))/(b*c^5) + 1/2*d*e*cos(a/b)*cos_integral(a/b +
 arcsin(c*x))/(b*c^3) - 3/4*e^2*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*
arcsin(c*x))/(b*c^5) + 1/2*d*e*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))
/(b*c^3) - 3/4*e^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/
(b*c^5) + 1/2*d*e*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^3) + 5/16*e
^2*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) + 9/16*e^2*cos(a/b)
*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^5) + 1/8*e^2*cos(a/b)*cos_integra
l(a/b + arcsin(c*x))/(b*c^5) + 1/16*e^2*sin(a/b)*sin_integral(5*a/b + 5*arc
sin(c*x))/(b*c^5) + 3/16*e^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(
b*c^5) + 1/8*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^5)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(e\,x^2+d\right)}^2}{a+b\,\mathrm{asin}\left(c\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^2/(a + b*asin(c*x)),x)
```

```
[Out] int((d + e*x^2)^2/(a + b*asin(c*x)), x)
```

3.669 $\int \frac{d+ex^2}{a+b\textbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=179

$$\frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}+\frac{e\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^3}-\frac{e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b}{}\right.}{4bc^3}$$

```
[Out] d*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+1/4*e*Ci((a+b*arcsin(c*x))/b)*cos(a/
b)/b/c^3-1/4*e*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b/c^3+d*Si((a+b*arcsin(
c*x))/b)*sin(a/b)/b/c+1/4*e*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^3-1/4*e*Si
(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^3
```

Rubi [A]

time = 0.22, antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {4757, 4719, 3384, 3380, 3383, 4731, 4491}

$$\frac{e\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^3}-\frac{e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4bc^3}+\frac{e\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4bc^3}-\frac{e\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4bc^3}+\frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}+\frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (e*Cos[a/b]*CosInte
gral[(a + b*ArcSin[c*x])/b])/(4*b*c^3) - (e*Cos[(3*a)/b]*CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b])/(4*b*c^3) + (d*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x
])/b])/(b*c) + (e*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b*c^3) -
(e*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$\int \frac{d+ex^2}{a+b\sin^{-1}(cx)}\,dx = \int \left(\frac{d}{a+b\sin^{-1}(cx)} + \frac{ex^2}{a+b\sin^{-1}(cx)}\right)dx$$
$$= d\int \frac{1}{a+b\sin^{-1}(cx)}\,dx + e\int \frac{x^2}{a+b\sin^{-1}(cx)}\,dx$$
$$= \frac{d\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{e\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{c^3}$$
$$= \frac{e\text{Subst}\left(\int \left(\frac{\cos(x)}{4(a+bx)} - \frac{\cos(3x)}{4(a+bx)}\right)dx, x, \sin^{-1}(cx)\right)}{c^3} + \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x,\right.}{bc}$$
$$= \frac{d\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{e\text{Subst}\left(\int \frac{\cos(x)}{a+bx}\,dx, x, \sin^{-}\right.}{4c^3}$$
$$= \frac{d\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}+\right.}{a+ba}\right.}{4c^3}$$
$$= \frac{e\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{4bc^3} - \frac{e\cos\left(\frac{3a}{b}\right)\text{Ci}\left(\frac{3a}{b}+3\sin^{-1}(cx)\right)}{4bc^3} + \frac{d\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin\right.}{bc}$$

Mathematica [A]

time = 0.17, size = 125, normalized size = 0.70

$$\frac{(4c^2d+e)\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) - e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right) + 4c^2d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) + e\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right) - e\sin\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{4bc^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] ((4*c^2*d + e)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e*Cos[(3*a)/b]*Cos
Integral[3*(a/b + ArcSin[c*x])] + 4*c^2*d*Sin[a/b]*SinIntegral[a/b + ArcSin
[c*x]] + e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - e*Sin[(3*a)/b]*SinInte
gral[3*(a/b + ArcSin[c*x])])/(4*b*c^3)
```

Maple [A]

time = 0.06, size = 142, normalized size = 0.79

method	result
derivativedivides	$-\frac{-4\,\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d-4\,\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d+\text{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)}{}$
default	$-\frac{-4\,\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d-4\,\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d+\text{sinIntegral}\left(3\arcsin(cx)+\frac{3a}{b}\right)}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c^3*(-4*Si(arcsin(c*x)+a/b)*sin(a/b)*c^2*d-4*Ci(arcsin(c*x)+a/b)*cos(a
/b)*c^2*d+Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*e+Ci(3*arcsin(c*x)+3*a/b)*cos(
3*a/b)*e-Si(arcsin(c*x)+a/b)*sin(a/b)*e-Ci(arcsin(c*x)+a/b)*cos(a/b)*e)/b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((x^2*e + d)/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((x^2*e + d)/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{d + ex^2}{a + b \operatorname{asin}(cx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x)),x)
```

```
[Out] Integral((d + e*x**2)/(a + b*asin(c*x)), x)
```

Giac [A]
time = 0.44, size = 229, normalized size = 1.28

$$-\frac{e\cos\left(\frac{a}{b}\right)^{3}\operatorname{Ci}\left(\frac{3a}{b} + 3\arcsin\left(cx\right)\right)}{bc^{3}} + \frac{d\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b} + \arcsin\left(cx\right)\right)}{bc} - \frac{e\cos\left(\frac{a}{b}\right)^{2}\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b} + 3\arcsin\left(cx\right)\right)}{bc^{3}} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b} + \arcsin\left(cx\right)\right)}{bc} + \frac{3e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b} + 3\arcsin\left(cx\right)\right)}{4bc^{3}} + \frac{e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b} + \arcsin\left(cx\right)\right)}{4bc^{3}} + \frac{e\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b} + 3\arcsin\left(cx\right)\right)}{4bc^{3}} + \frac{e\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b} + \arcsin\left(cx\right)\right)}{4bc^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -e*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d*cos(a/b)*cos_
integral(a/b + arcsin(c*x))/(b*c) - e*cos(a/b)^2*sin(a/b)*sin_integral(3*a/
b + 3*arcsin(c*x))/(b*c^3) + d*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*
c) + 3/4*e*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e*cos
```

```
(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c^3) + 1/4*e*sin(a/b)*sin_integral
(3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e*sin(a/b)*sin_integral(a/b + arcsin(
c*x))/(b*c^3)
```

Mupad [**F**]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e\,x^2+d}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)/(a + b*asin(c*x)),x)
```

```
[Out] int((d + e*x^2)/(a + b*asin(c*x)), x)
```

3.670 $\int \frac{1}{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=53

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}$$

```
[Out] Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
```

Rubi [A]
time = 0.05, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4719, 3384, 3380, 3383}

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^(-1),x]
```

```
[Out] (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (Sin[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
```

```
, n}, x]
```

Rubi steps

$$\int \frac{1}{a+b\sin^{-1}(cx)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc}$$
$$= \frac{\cos\left(\frac{a}{b}\right)\text{Ci}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\sin^{-1}(cx)}{b}\right)}{bc}$$

Mathematica [A]
time = 0.02, size = 44, normalized size = 0.83

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^(-1),x]
[Out] (Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b + ArcSi
n[c*x]])/(b*c)
```

Maple [A]
time = 0.06, size = 48, normalized size = 0.91

method	result	size
derivativedivides	$\frac{\frac{\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48
default	$\frac{\frac{\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/c*(Si(arcsin(c*x)+a/b)*sin(a/b)/b+Ci(arcsin(c*x)+a/b)*cos(a/b)/b)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/(b*arcsin(c*x) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(1/(b*arcsin(c*x) + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{a + b\,\mathrm{asin}\,(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/(a + b*asin(c*x)), x)
```

Giac [A]
time = 0.41, size = 49, normalized size = 0.92

$$\frac{\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\frac{a}{b} + \arcsin\left(cx\right)\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a}{b} + \arcsin\left(cx\right)\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + sin(a/b)*sin_integral(a/b
+ arcsin(c*x))/(b*c)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{a + b\,\mathrm{asin}\,(c\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*asin(c*x)),x)
```

```
[Out] int(1/(a + b*asin(c*x)), x)
```

3.671 $\int \frac{1}{(d+ex^2)(a+b\textbf{ArcSin}(cx))} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{1}{(d+ex^2)\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.95, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)\,(a+b\arcsin\,(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((x^2*e + d)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(a*x^2*e + a*d + (b*x^2*e + b*d)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a + b \operatorname{asin}(cx))(d + ex^2)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)), x)
```

3.672 $\int \frac{1}{(d+ex^2)^2(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{(d+ex^2)^2\,(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^2\,(a+b\sin^{-1}(cx))}\,dx = \int \frac{1}{(d+ex^2)^2\,(a+b\sin^{-1}(cx))}\,dx$$

Mathematica [A]
time = 2.31, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)^2\,(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 3.22, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)^2\,(a+b\arcsin(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((x^2*e + d)^2*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(a*x^4*e^2 + 2*a*d*x^2*e + a*d^2 + (b*x^4*e^2 + 2*b*d*x^2*e + b*
d^2)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}\left(cx\right)\right) \left(d + ex^{2}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^2),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^2), x)
```

3.673 $\int \frac{\sqrt{d+ex^2}}{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\sqrt{d+ex^2}}{a+b\text{ArcSin}(cx)},x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}}{a+b\text{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)}\,dx = \int \frac{\sqrt{d+ex^2}}{a+b\sin^{-1}(cx)}\,dx$$

Mathematica [A]
time = 0.80, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d+ex^2}}{a+b\text{ArcSin}(cx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]),x]
[Out] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]), x]
```

Maple [A]
time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^2+d}}{a+b\arcsin(cx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(x^2*e + d)/(b*arcsin(c*x) + a), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^2*e + d)/(b*arcsin(c*x) + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d + ex^2}}{a + b \operatorname{asin}(cx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(sqrt(d + e*x**2)/(a + b*asin(c*x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{e\,x^2+d}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^(1/2)/(a + b*asin(c*x)),x)
[Out] int((d + e*x^2)^(1/2)/(a + b*asin(c*x)), x)
```

3.674 $\int \frac{1}{\sqrt{d+ex^2}\,(a+b\mathbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=25

$$\operatorname{Int}\left(\frac{1}{\sqrt{d+ex^2}\,(a+b\operatorname{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\sqrt{d+ex^2}\,(a+b\operatorname{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{d+ex^2}\,\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{1}{\sqrt{d+ex^2}\,\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d+ex^2}\,(a+b\operatorname{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/(sqrt(x^2*e + d)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(x^2*e + d)/(a*x^2*e + a*d + (b*x^2*e + b*d)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a + b \operatorname{asin}(cx)) \sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*sqrt(d + e*x**2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a + b\,\mathrm{asin}\,(c\,x))\,\sqrt{e\,x^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^(1/2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^(1/2)), x)
```

3.675 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\mathbf{ArcSin}(cx))} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+ex^2)^{3/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))} dx = \int \frac{1}{(d+ex^2)^{3/2}(a+b\sin^{-1}(cx))} dx$$

Mathematica [A]
time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\text{ArcSin}(cx))} dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)^{\frac{3}{2}}(a+b\arcsin(cx))} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
```

```
[Out] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^2*e + d)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^2*e + d)/(a*x^4*e^2 + 2*a*d*x^2*e + a*d^2 + (b*x^4*e^2 + 2*
b*d*x^2*e + b*d^2)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}{\left(cx \right)}\right) \left(d + ex^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(3/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**(3/2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\,(e\,x^2+d)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^(3/2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^(3/2)), x)
```

3.676 $\int \frac{1}{\left(d+ex^2\right)^{5/2}(a+b\textbf{ArcSin}(cx))}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{\left(d+ex^2\right)^{5/2}(a+b\text{ArcSin}(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx = \int \frac{1}{\left(d+ex^2\right)^{5/2}\left(a+b\sin^{-1}(cx)\right)}\,dx$$

Mathematica [A]
time = 2.69, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d+ex^2\right)^{5/2}(a+b\text{ArcSin}(cx))}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [A]
time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\,x^{2}+d\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((x^2*e + d)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(x^2*e + d)/(a*x^6*e^3 + 3*a*d*x^4*e^2 + 3*a*d^2*x^2*e + a*d^3
 + (b*x^6*e^3 + 3*b*d*x^4*e^2 + 3*b*d^2*x^2*e + b*d^3)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}{\left(c x \right)}\right) \left(d + e x^{2}\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**(5/2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\operatorname{asin}(cx))\ (ex^2+d)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^(5/2)), x)
```

3.677 $\int \frac{(d+ex^2)^2}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=498

$$-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}+\frac{d^2\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}$$

```
[Out] -d^2*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c-1/2*d*e*cos(a/b)*Si((a+b*arcsin
(c*x))/b)/b^2/c^3-1/8*e^2*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c^5+3/2*d*e*
cos(3*a/b)*Si(3*(a+b*arcsin(c*x))/b)/b^2/c^3+9/16*e^2*cos(3*a/b)*Si(3*(a+b*
arcsin(c*x))/b)/b^2/c^5-5/16*e^2*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b^2/c
^5+d^2*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c+1/2*d*e*Ci((a+b*arcsin(c*x))/
b)*sin(a/b)/b^2/c^3+1/8*e^2*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^5-3/2*d*
e*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^3-9/16*e^2*Ci(3*(a+b*arcsin(c*
x))/b)*sin(3*a/b)/b^2/c^5+5/16*e^2*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b^2
/c^5-d^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-2*d*e*x^2*(-c^2*x^2+1)^(1
/2)/b/c/(a+b*arcsin(c*x))-e^2*x^4*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

Rubi [A]
time = 0.51, antiderivative size = 498, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used = {4757, 4717, 4809, 3384, 3380, 3383, 4727}

$$\frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^5}-\frac{9e^2\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^5}+\frac{5e^2\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^5}-\frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{8b^2c^5}+\frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^5}-\frac{5e^2\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\text{ArcSin}(cx))}{b}\right)}{16b^2c^5}+\frac{de\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{2b^2c^3}-\frac{3de\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c^3}-\frac{de\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{2b^2c^3}+\frac{3de\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{2b^2c^3}+\frac{d^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c}-\frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c}-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (2*d*e*x^2*Sqrt[1 -
c^2*x^2])/(b*c*(a + b*ArcSin[c*x])) - (e^2*x^4*Sqrt[1 - c^2*x^2])/(b*c*(a +
 b*ArcSin[c*x])) + (d^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2*c
) + (d*e*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(2*b^2*c^3) + (e^2*Co
sIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b^2*c^5) - (3*d*e*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(2*b^2*c^3) - (9*e^2*CosIntegral[
(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b^2*c^5) + (5*e^2*CosIntegral[
(5*(a + b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b^2*c^5) - (d^2*Cos[a/b]*SinIn
tegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (d*e*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(2*b^2*c^3) - (e^2*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])
/b])/(8*b^2*c^5) + (3*d*e*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/
b])/(2*b^2*c^3) + (9*e^2*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(16*b^2*c^5) - (5*e^2*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(16*b^2*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex^2)^2}{(a+b\sin^{-1}(cx))^2}\,dx &= \int \left(\frac{d^2}{(a+b\sin^{-1}(cx))^2}+\frac{2dex^2}{(a+b\sin^{-1}(cx))^2}+\frac{e^2x^4}{(a+b\sin^{-1}(cx))^2}\right)dx \\
&= d^2\int \frac{1}{(a+b\sin^{-1}(cx))^2}\,dx+(2de)\int \frac{x^2}{(a+b\sin^{-1}(cx))^2}\,dx+e^2\int \frac{x^4}{(a+b\sin^{-1}(\ldots} \\
&= -\frac{d^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{(cd^2)\int \ldots}{\ldots} \\
&= -\frac{d^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{d^2\text{Subst}\left(\int \ldots\right.}{\ldots} \\
&= -\frac{d^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{\left(d^2\cos\left(\frac{a}{b}\right)\ldots\right.}{\ldots} \\
&= -\frac{d^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))}+\frac{d^2\text{Ci}\left(\frac{a}{b}+\ldots\right.}{\ldots}
\end{aligned}$$

Mathematica [A]
time = 1.30, size = 359, normalized size = 0.72

$$-\frac{\frac{16bc^4d^2\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}+\frac{32bc^4dex^2\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}+\frac{16bc^4e^2x^4\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}-2(8c^4d^2+4c^2de+e^2)\,\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)+3e(8c^2d+3e)\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)-5e^2\text{CosIntegral}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{5a}{b}\right)+16c^4d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+8c^2de\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+2e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)-24c^2de\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)-9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)+5e^2\cos\left(\frac{5a}{b}\right)\text{Si}\left(5\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{16b^2c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/16*((16*b*c^4*d^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (32*b*c^4*d*e
*x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (16*b*c^4*e^2*x^4*Sqrt[1 - c^
2*x^2])/(a + b*ArcSin[c*x]) - 2*(8*c^4*d^2 + 4*c^2*d*e + e^2)*CosIntegral[a
/b + ArcSin[c*x]]*Sin[a/b] + 3*e*(8*c^2*d + 3*e)*CosIntegral[3*(a/b + ArcSi
n[c*x])]*Sin[(3*a)/b] - 5*e^2*CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/
b] + 16*c^4*d^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 8*c^2*d*e*Cos[a/b
]*SinIntegral[a/b + ArcSin[c*x]] + 2*e^2*Cos[a/b]*SinIntegral[a/b + ArcSin[
c*x]] - 24*c^2*d*e*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 9*e^2*
Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*e^2*Cos[(5*a)/b]*SinInt
egral[5*(a/b + ArcSin[c*x])])/(b^2*c^5)
```

Maple [A]
time = 0.43, size = 795, normalized size = 1.60

method	result	size

derivativedivides	Expression too large to display	795
default	Expression too large to display	795

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/c^5*(2*(-c^2*x^2+1)^(1/2)*b*e^2+8*(-c^2*x^2+1)^(1/2)*b*c^2*d*e+5*Si(5
*arcsin(c*x)+5*a/b)*cos(5*a/b)*a*e^2-5*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a
*e^2-9*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*e^2+9*Ci(3*arcsin(c*x)+3*a/b)*s
in(3*a/b)*a*e^2+2*cos(a/b)*Si(arcsin(c*x)+a/b)*a*e^2-2*Ci(arcsin(c*x)+a/b)*
sin(a/b)*a*e^2+16*(-c^2*x^2+1)^(1/2)*b*c^4*d^2-16*arcsin(c*x)*Ci(arcsin(c*x
)+a/b)*sin(a/b)*b*c^4*d^2-24*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*c^2*d*e+2
4*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a*c^2*d*e+8*cos(a/b)*Si(arcsin(c*x)+a/
b)*a*c^2*d*e-8*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^2*d*e+16*arcsin(c*x)*cos(a/
b)*Si(arcsin(c*x)+a/b)*b*c^4*d^2+cos(5*arcsin(c*x))*b*e^2-3*cos(3*arcsin(c*
x))*b*e^2+16*cos(a/b)*Si(arcsin(c*x)+a/b)*a*c^4*d^2-16*Ci(arcsin(c*x)+a/b)*
sin(a/b)*a*c^4*d^2+5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b*e^2-5
*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b*e^2-9*arcsin(c*x)*Si(3*ar
csin(c*x)+3*a/b)*cos(3*a/b)*b*e^2+9*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*sin
(3*a/b)*b*e^2+2*arcsin(c*x)*cos(a/b)*Si(arcsin(c*x)+a/b)*b*e^2-2*arcsin(c*x
)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*e^2-8*cos(3*arcsin(c*x))*b*c^2*d*e-24*arcs
in(c*x)*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*c^2*d*e+24*arcsin(c*x)*Ci(3*ar
csin(c*x)+3*a/b)*sin(3*a/b)*b*c^2*d*e+8*arcsin(c*x)*cos(a/b)*Si(arcsin(c*x)
+a/b)*b*c^2*d*e-8*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d*e)/(a+b*
arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((x^4*e^2 + 2*d*x^2*e + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1) - (b^2*c*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((5*c^2*x^5*e^2 + 2*(
3*c^2*d*e - 2*e^2)*x^3 + (c^2*d^2 - 4*d*e)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)/
(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*
c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((x^4*e^2 + 2*d*x^2*e + d^2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x)
 + a^2), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(d+ex^2)^2}{(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((d + e*x**2)**2/(a + b*asin(c*x))**2, x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 2337 vs. $2(472) = 944$.
time = 0.49, size = 2337, normalized size = 4.69

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 5*b*e^2*arcsin(c*x)*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)
/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 6*b*c^2*d*e*arcsin(c*x)*cos(a/b)^2*cos
_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
 + b*c^4*d^2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*
arcsin(c*x) + a*b^2*c^5) - 5*b*e^2*arcsin(c*x)*cos(a/b)^5*sin_integral(5*a/
b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 6*b*c^2*d*e*arcsin(c
*x)*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a
*b^2*c^5) - b*c^4*d^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/
(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5*a*e^2*cos(a/b)^4*cos_integral(5*a/b +
 5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 6*a*c^2*d*e*co
s(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x)
+ a*b^2*c^5) + a*c^4*d^2*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*
arcsin(c*x) + a*b^2*c^5) - 5*a*e^2*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin
(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 6*a*c^2*d*e*cos(a/b)^3*sin_integ
ral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - a*c^4*d^2*co
s(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) -
15/4*b*e^2*arcsin(c*x)*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a
/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 3/2*b*c^2*d*e*arcsin(c*x)*cos_integ
ral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/4
```

```
*b*e^2*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/
(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 1/2*b*c^2*d*e*arcsin(c*x)*cos_integral(
a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 25/4*b*e^2*
arcsin(c*x)*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(
c*x) + a*b^2*c^5) - 9/2*b*c^2*d*e*arcsin(c*x)*cos(a/b)*sin_integral(3*a/b +
 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/4*b*e^2*arcsin(c*x)*c
os(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*
c^5) - 1/2*b*c^2*d*e*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(
b^3*c^5*arcsin(c*x) + a*b^2*c^5) - sqrt(-c^2*x^2 + 1)*b*c^4*d^2/(b^3*c^5*ar
csin(c*x) + a*b^2*c^5) - 15/4*a*e^2*cos(a/b)^2*cos_integral(5*a/b + 5*arcsi
n(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 3/2*a*c^2*d*e*cos_inte
gral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/
4*a*e^2*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*ar
csin(c*x) + a*b^2*c^5) + 1/2*a*c^2*d*e*cos_integral(a/b + arcsin(c*x))*sin(
a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 25/4*a*e^2*cos(a/b)^3*sin_integral
(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/2*a*c^2*d*e*c
os(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^
5) + 9/4*a*e^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcs
in(c*x) + a*b^2*c^5) - 1/2*a*c^2*d*e*cos(a/b)*sin_integral(a/b + arcsin(c*x
))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 2*(-c^2*x^2 + 1)^(3/2)*b*c^2*d*e/(b^
3*c^5*arcsin(c*x) + a*b^2*c^5) + 5/16*b*e^2*arcsin(c*x)*cos_integral(5*a/b
+ 5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/16*b*e^2*ar
csin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x)
 + a*b^2*c^5) + 1/8*b*e^2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a
/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 25/16*b*e^2*arcsin(c*x)*cos(a/b)*si
n_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 27/16
*b*e^2*arcsin(c*x)*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*ar
csin(c*x) + a*b^2*c^5) - 1/8*b*e^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b +
arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*sqrt(-c^2*x^2 + 1)*b*c^2
*d*e/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - (c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)
*b*e^2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5/16*a*e^2*cos_integral(5*a/b +
5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/16*a*e^2*cos_
integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
+ 1/8*a*e^2*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) +
 a*b^2*c^5) - 25/16*a*e^2*cos(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3
*c^5*arcsin(c*x) + a*b^2*c^5) - 27/16*a*e^2*cos(a/b)*sin_integral(3*a/b + 3
*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 1/8*a*e^2*cos(a/b)*sin_in
tegral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 2*(-c^2*x^2 +
 1)^(3/2)*b*e^2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - sqrt(-c^2*x^2 + 1)*b*e^
2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(e\,x^2+d)^2}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^2/(a + b*asin(c*x))^2,x)
```

```
[Out] int((d + e*x^2)^2/(a + b*asin(c*x))^2, x)
```

3.678 $\int \frac{d+ex^2}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=249

$$-\frac{d\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}-\frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}+\frac{d\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}+\frac{e\text{CosIntegral}\left(\frac{a+b\text{ArcS}}{b}\right.}{4b^2c^3}$$

```
[Out] -d*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c-1/4*e*cos(a/b)*Si((a+b*arcsin(c*x
))/b)/b^2/c^3+3/4*e*cos(3*a/b)*Si(3*(a+b*arcsin(c*x))/b)/b^2/c^3+d*Ci((a+b*
arcsin(c*x))/b)*sin(a/b)/b^2/c+1/4*e*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c
^3-3/4*e*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^3-d*(-c^2*x^2+1)^(1/2)/
b/c/(a+b*arcsin(c*x))-e*x^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

Rubi [A]
time = 0.27, antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {4757, 4717, 4809, 3384, 3380, 3383, 4727}

$$\frac{e\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^3}-\frac{3e\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^3}-\frac{e\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{4b^2c^3}+\frac{3e\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\text{ArcSin}(cx))}{b}\right)}{4b^2c^3}+\frac{d\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c}-\frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c}-\frac{d\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}-\frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (e*x^2*Sqrt[1 - c^2*x^
2])/(b*c*(a + b*ArcSin[c*x])) + (d*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a
/b])/(b^2*c) + (e*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b^2*c^3)
- (3*e*CosIntegral[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b^2*c^3) - (
d*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (e*Cos[a/b]*SinInt
egral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^3) + (3*e*Cos[(3*a)/b]*SinIntegral[(
3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{d+ex^2}{(a+b\sin^{-1}(cx))^2}\,dx = \int \left(\frac{d}{(a+b\sin^{-1}(cx))^2}+\frac{ex^2}{(a+b\sin^{-1}(cx))^2}\right)dx$$

$$= d\int \frac{1}{(a+b\sin^{-1}(cx))^2}\,dx + e\int \frac{x^2}{(a+b\sin^{-1}(cx))^2}\,dx$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} - \frac{(cd)\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx}{b}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} - \frac{d\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx, x, \sin^{-1}(cx)\right)}{bc}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} - \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx, x,\right.}{bc}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc\,(a+b\sin^{-1}(cx))} + \frac{d\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b^2c} + \frac{e\text{Ci}(}{}$$

Mathematica [A]
time = 0.63, size = 191, normalized size = 0.77

$$-\frac{\frac{4bc^2d\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}+\frac{4bc^2ex^2\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}-(4c^2d+e)\,\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)+3e\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)\sin\left(\frac{3a}{b}\right)+4c^2d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)+e\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)-3e\cos\left(\frac{3a}{b}\right)\text{Si}\left(3\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\right)}{4b^2c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*((4*b*c^2*d*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (4*b*c^2*e*x^2*Sq
rt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) - (4*c^2*d + e)*CosIntegral[a/b + ArcS
in[c*x]]*Sin[a/b] + 3*e*CosIntegral[3*(a/b + ArcSin[c*x])]*Sin[(3*a)/b] + 4
*c^2*d*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + e*Cos[a/b]*SinIntegral[a/b
 + ArcSin[c*x]] - 3*e*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(b^2
*c^3)
```

Maple [A]
time = 0.21, size = 367, normalized size = 1.47

method	result
derivativedivides	$-4\arcsin(cx)\,\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d+4\arcsin(cx)\,\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d-4\,\text{sinInteg}$
default	$-4\arcsin(cx)\,\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d+4\arcsin(cx)\,\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d-4\,\text{sinInteg}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/c^3*(-4*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*c^2*d+4*arcsin(c*x)*
Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d-4*Si(arcsin(c*x)+a/b)*cos(a/b)*a*c^2*d
+4*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^2*d+3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/
b)*cos(3*a/b)*b*e-3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b*e-arcs
in(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*e+arcsin(c*x)*Ci(arcsin(c*x)+a/b)*si
n(a/b)*b*e-4*(-c^2*x^2+1)^(1/2)*b*c^2*d+3*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b
)*a*e-3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a*e-Si(arcsin(c*x)+a/b)*cos(a/b)
*a*e+Ci(arcsin(c*x)+a/b)*sin(a/b)*a*e+cos(3*arcsin(c*x))*b*e-(-c^2*x^2+1)^(
1/2)*b*e)/(a+b*arcsin(c*x))/b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1) - (b^2*c*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((3*c^2*x^3*e + (c^2*d - 2*e)*x)*sqrt
(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((x^2*e + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{d + ex^2}{\left(a + b \operatorname{asin}\left(cx\right)\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((d + e*x**2)/(a + b*asin(c*x))**2, x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 891 vs. 2(237) = 474.
time = 0.46, size = 891, normalized size = 3.58

$$-\frac{3\,be\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{bc^{2}d\arcsin\left(cx\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{3\,be\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}-\frac{bc^{2}d\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}-\frac{3\,ae\cos\left(\frac{a}{b}\right)^{2}\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{ac^{2}d\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{3\,ae\cos\left(\frac{a}{b}\right)^{3}\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}-\frac{ac^{2}d\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{3\,be\arcsin\left(cx\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}+\frac{be\arcsin\left(cx\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}-\frac{9\,be\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}-\frac{be\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}-\frac{\sqrt{-c^{2}x^{2}+1}\,bc^{2}d}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}+\frac{3\,ae\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}+\frac{ae\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}-\frac{9\,ae\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin\left(cx\right)\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}-\frac{ae\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{4\left(b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}\right)}+\frac{{\left(-c^{2}x^{2}+1\right)}^{\frac{3}{2}}be}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}-\frac{\sqrt{-c^{2}x^{2}+1}\,be}{b^{3}c^{3}\arcsin\left(cx\right)+ab^{2}c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -3*b*e*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/
(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*c^2*d*arcsin(c*x)*cos_integral(a/b +
arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 3*b*e*arcsin(c*x)
*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^
2*c^3) - b*c^2*d*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*
c^3*arcsin(c*x) + a*b^2*c^3) - 3*a*e*cos(a/b)^2*cos_integral(3*a/b + 3*arcs
in(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + a*c^2*d*cos_integral(
a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 3*a*e*cos(a
/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
 - a*c^2*d*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
a*b^2*c^3) + 3/4*b*e*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/
b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*e*arcsin(c*x)*cos_integral(a/b
 + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*b*e*arcsin
(c*x)*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a
*b^2*c^3) - 1/4*b*e*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) - sqrt(-c^2*x^2 + 1)*b*c^2*d/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) + 3/4*a*e*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/
(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*a*e*cos_integral(a/b + arcsin(c*x))
*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*a*e*cos(a/b)*sin_integral
(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/4*a*e*cos(a/b
)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + (-c^2
*x^2 + 1)^(3/2)*b*e/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - sqrt(-c^2*x^2 + 1)*
b*e/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{e\,x^2+d}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)/(a + b*asin(c*x))^2,x)
```

```
[Out] int((d + e*x^2)/(a + b*asin(c*x))^2, x)
```

3.679 $\int \frac{1}{(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=86

$$-\frac{\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}+\frac{\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c}$$

[Out] -cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c+Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c-(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))

Rubi [A]
time = 0.11, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4717, 4809, 3384, 3380, 3383}

$$\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\text{ArcSin}(cx)}{b}\right)}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\text{ArcSin}(cx))}$$

Antiderivative was successfully verified.

[In] Int[(a + b*ArcSin[c*x])^(-2),x]

[Out] -(Sqrt[1 - c^2*x^2]/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2*c) - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c)

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^2}\,dx &= -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{c\int \frac{x}{\sqrt{1-c^2x^2}\,(a+b\sin^{-1}(cx))}\,dx}{b}\\ &= -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\text{Subst}\left(\int \frac{\sin(x)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}\\ &= -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)}-\frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{a+bx}\,dx,x,\sin^{-1}(cx)\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Subs}}{}\\ &= -\frac{\sqrt{1-c^2x^2}}{bc\left(a+b\sin^{-1}(cx)\right)}+\frac{\text{Ci}\left(\frac{a}{b}+\sin^{-1}(cx)\right)\sin\left(\frac{a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\sin^{-1}(cx)\right)}{b^2c}\end{aligned}$$

Mathematica [A]
time = 0.12, size = 72, normalized size = 0.84

$$\frac{-\frac{b\sqrt{1-c^2x^2}}{a+b\text{ArcSin}(cx)}+\text{CosIntegral}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)\sin\left(\frac{a}{b}\right)-\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ArcSin}(cx)\right)}{b^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^(-2),x]
[Out] (-((b*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + CosIntegral[a/b + ArcSin[c*
x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c)
```

Maple [A]
time = 0.07, size = 76, normalized size = 0.88

method	result	size
derivativedivides	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}-\frac{\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$	76
default	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}-\frac{\text{sinIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{cosineIntegral}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$	76

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))/b-(Si(arcsin(c*x)+a/b)*cos(a/b)-
Ci(arcsin(c*x)+a/b)*sin(a/b))/b^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)*integrate(s
qrt(c*x + 1)*sqrt(-c*x + 1)*x/(a*b*c^2*x^2 - a*b + (b^2*c^2*x^2 - b^2)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x + 1))
/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a+b\operatorname{asin}(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((a + b*asin(c*x))**(-2), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 192 vs. $2(84) = 168$.

time = 0.44, size = 192, normalized size = 2.23

$$\frac{b \arcsin(cx) \operatorname{Ci}\left(\frac{a}{b} + \arcsin(cx)\right) \sin\left(\frac{a}{b}\right)}{b^3 c \arcsin(cx) + ab^2 c} - \frac{b \arcsin(cx) \cos\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{a}{b} + \arcsin(cx)\right)}{b^3 c \arcsin(cx) + ab^2 c} + \frac{a \operatorname{Ci}\left(\frac{a}{b} + \arcsin(cx)\right) \sin\left(\frac{a}{b}\right)}{b^3 c \arcsin(cx) + ab^2 c} - \frac{a \cos\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{a}{b} + \arcsin(cx)\right)}{b^3 c \arcsin(cx) + ab^2 c} - \frac{\sqrt{-c^2x^2 + 1}\, b}{b^3 c \arcsin(cx) + ab^2 c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) +
 a*b^2*c) - b*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) + a*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*a
rcsin(c*x) + a*b^2*c) - a*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) - sqrt(-c^2*x^2 + 1)*b/(b^3*c*arcsin(c*x) + a*b^2*c)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(a + b \operatorname{asin}\left(c\,x\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*asin(c*x))^2,x)
```

```
[Out] int(1/(a + b*asin(c*x))^2, x)
```

3.680 $\int \frac{1}{(d+ex^2)(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))^2},x\right)$$

[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2),x]

[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])^2), x]

Rubi steps

$$\int \frac{1}{(d+ex^2)\,(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{1}{(d+ex^2)\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 13.72, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2),x]

[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2), x]

Maple [A]
time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((a*b*c*x^2*e + a*b*c*d + (b^2*c*x^2*e + b^2*c*d)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))*integrate((c^2*x^3*e - (c^2*d + 2*e)*x)*sqrt(c*x + 1)*s
qrt(-c*x + 1)/(a*b*c^3*x^6*e^2 - a*b*c*d^2 + (2*a*b*c^3*d*e - a*b*c*e^2)*x^
4 + (a*b*c^3*d^2 - 2*a*b*c*d*e)*x^2 + (b^2*c^3*x^6*e^2 - b^2*c*d^2 + (2*b^2
*c^3*d*e - b^2*c*e^2)*x^4 + (b^2*c^3*d^2 - 2*b^2*c*d*e)*x^2)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))), x) + sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*x^
2*e + a*b*c*d + (b^2*c*x^2*e + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*x^2*e + a^2*d + (b^2*x^2*e + b^2*d)*arcsin(c*x)^2 + 2*(a*b*
x^2*e + a*b*d)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}{\left(cx \right)}\right)^{2} \left(d + ex^{2}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x**2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\,\mathrm{asin}\left(c\,x\right))^2\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)),x)
```

```
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)), x)
```

3.681 $\int \frac{1}{(d+ex^2)^2(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx = \int \frac{1}{(d+ex^2)^2\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 35.86, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 3.62, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)^2\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((a*b*c*x^4*e^2 + 2*a*b*c*d*x^2*e + a*b*c*d^2 + (b^2*c*x^4*e^2 + 2*b^2*c*d
*x^2*e + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((
3*c^2*x^3*e - (c^2*d + 4*e)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*x^8*e^
3 + (3*a*b*c^3*d*e^2 - a*b*c*e^3)*x^6 - a*b*c*d^3 + 3*(a*b*c^3*d^2*e - a*b*
c*d*e^2)*x^4 + (a*b*c^3*d^3 - 3*a*b*c*d^2*e)*x^2 + (b^2*c^3*x^8*e^3 + (3*b^
2*c^3*d*e^2 - b^2*c*e^3)*x^6 - b^2*c*d^3 + 3*(b^2*c^3*d^2*e - b^2*c*d*e^2)*
x^4 + (b^2*c^3*d^3 - 3*b^2*c*d^2*e)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x) + sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*x^4*e^2 + 2*a*b*c*d*x^
2*e + a*b*c*d^2 + (b^2*c*x^4*e^2 + 2*b^2*c*d*x^2*e + b^2*c*d^2)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*x^4*e^2 + 2*a^2*d*x^2*e + a^2*d^2 + (b^2*x^4*e^2 + 2*b^2*d*
x^2*e + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*x^4*e^2 + 2*a*b*d*x^2*e + a*b*d^2)*
arcsin(c*x)), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))^2\,(e\,x^2+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^2),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^2), x)
```

3.682 $\int \frac{\sqrt{d+ex^2}}{(a+b\mathbf{ArcSin}(cx))^2} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\sqrt{d+ex^2}}{(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}}{(a+b\text{ArcSin}(cx))^2} dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2} dx = \int \frac{\sqrt{d+ex^2}}{\left(a+b\sin^{-1}(cx)\right)^2} dx$$

Mathematica [A]
time = 4.91, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d+ex^2}}{(a+b\text{ArcSin}(cx))^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2, x]
```

Maple [A]
time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^2+d}}{\left(a+b\arcsin\left(cx\right)\right)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((2*c^
2*x^3*e + (c^2*d - e)*x)*sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*
c^3*x^4*e - a*b*c*d + (a*b*c^3*d - a*b*c*e)*x^2 + (b^2*c^3*x^4*e - b^2*c*d
+ (b^2*c^3*d - b^2*c*e)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x
) - sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1))/(b^2*c*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^2*e + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d + ex^2}}{\left(a + b\operatorname{asin}\left(cx\right)\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d + e*x**2)/(a + b*asin(c*x))**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a)^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{e\,x^2+d}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^(1/2)/(a + b*asin(c*x))^2,x)
```

```
[Out] int((d + e*x^2)^(1/2)/(a + b*asin(c*x))^2, x)
```

3.683 $\int \frac{1}{\sqrt{d+ex^2}\,(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{\sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{d+ex^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx=\int \frac{1}{\sqrt{d+ex^2}\,\left(a+b\sin^{-1}(cx)\right)^2}\,dx$$

Mathematica [A]
time = 8.50, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d+ex^2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((a*b*c^3*d^2 + a*b*c*d*e + (a*b*c^3*d*e + a*b*c*e^2)*x^2 + (b^2*c^3*d^2 +
b^2*c*d*e + (b^2*c^3*d*e + b^2*c*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)))*integrate(sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x/(a*b*c
^3*x^6*e^2 - a*b*c*d^2 + (2*a*b*c^3*d*e - a*b*c*e^2)*x^4 + (a*b*c^3*d^2 - 2
*a*b*c*d*e)*x^2 + (b^2*c^3*x^6*e^2 - b^2*c*d^2 + (2*b^2*c^3*d*e - b^2*c*e^2
)*x^4 + (b^2*c^3*d^2 - 2*b^2*c*d*e)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x) - sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*x^2*e
+ a*b*c*d + (b^2*c*x^2*e + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^2*e + d)/(a^2*x^2*e + a^2*d + (b^2*x^2*e + b^2*d)*arcsin(c*
x)^2 + 2*(a*b*x^2*e + a*b*d)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}{\left(cx \right)}\right)^{2} \sqrt{d + ex^{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**2*sqrt(d + e*x**2)), x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\sqrt{e\,x^2+d}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(1/2)),x)
```

```
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(1/2)), x)
```

3.684 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+ex^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^{3/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 18.61, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((a*b*c*x^4*e^2 + 2*a*b*c*d*x^2*e + a*b*c*d^2 + (b^2*c*x^4*e^2 + 2*b^2*c*d
*x^2*e + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((
2*c^2*x^3*e - (c^2*d + 3*e)*x)*sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)
/(a*b*c^3*x^8*e^3 + (3*a*b*c^3*d*e^2 - a*b*c*e^3)*x^6 - a*b*c*d^3 + 3*(a*b*
c^3*d^2*e - a*b*c*d*e^2)*x^4 + (a*b*c^3*d^3 - 3*a*b*c*d^2*e)*x^2 + (b^2*c^3
*x^8*e^3 + (3*b^2*c^3*d*e^2 - b^2*c*e^3)*x^6 - b^2*c*d^3 + 3*(b^2*c^3*d^2*e
 - b^2*c*d*e^2)*x^4 + (b^2*c^3*d^3 - 3*b^2*c*d^2*e)*x^2)*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))), x) + sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1
))/(a*b*c*x^4*e^2 + 2*a*b*c*d*x^2*e + a*b*c*d^2 + (b^2*c*x^4*e^2 + 2*b^2*c*
d*x^2*e + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^2*e + d)/(a^2*x^4*e^2 + 2*a^2*d*x^2*e + a^2*d^2 + (b^2*x^4*
e^2 + 2*b^2*d*x^2*e + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*x^4*e^2 + 2*a*b*d*x^2
*e + a*b*d^2)*arcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}{\left(cx \right)}\right)^{2} \left(d + ex^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x**2)**(3/2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(e\,x^2+d\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(3/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(3/2)), x)
```

3.685 $\int \frac{1}{(d+ex^2)^{5/2}(a+b\mathbf{ArcSin}(cx))^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+ex^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^{5/2}\,(a+b\sin^{-1}(cx))^2}\,dx$$

Mathematica [A]
time = 35.55, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\text{ArcSin}(cx))^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [A]
time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)^{\frac{5}{2}}\,(a+b\arcsin(cx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -((a*b*c*x^6*e^3 + 3*a*b*c*d*x^4*e^2 + 3*a*b*c*d^2*x^2*e + a*b*c*d^3 + (b^2
*c*x^6*e^3 + 3*b^2*c*d*x^4*e^2 + 3*b^2*c*d^2*x^2*e + b^2*c*d^3)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((4*c^2*x^3*e - (c^2*d + 5*e)*x)*
sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*x^10*e^4 + (4*a*b*c^3
*d*e^3 - a*b*c*e^4)*x^8 - a*b*c*d^4 + 2*(3*a*b*c^3*d^2*e^2 - 2*a*b*c*d*e^3)
*x^6 + 2*(2*a*b*c^3*d^3*e - 3*a*b*c*d^2*e^2)*x^4 + (a*b*c^3*d^4 - 4*a*b*c*d
^3*e)*x^2 + (b^2*c^3*x^10*e^4 + (4*b^2*c^3*d*e^3 - b^2*c*e^4)*x^8 - b^2*c*d
^4 + 2*(3*b^2*c^3*d^2*e^2 - 2*b^2*c*d*e^3)*x^6 + 2*(2*b^2*c^3*d^3*e - 3*b^2
*c*d^2*e^2)*x^4 + (b^2*c^3*d^4 - 4*b^2*c*d^3*e)*x^2)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))), x) + sqrt(x^2*e + d)*sqrt(c*x + 1)*sqrt(-c*x + 1))/(
a*b*c*x^6*e^3 + 3*a*b*c*d*x^4*e^2 + 3*a*b*c*d^2*x^2*e + a*b*c*d^3 + (b^2*c*
x^6*e^3 + 3*b^2*c*d*x^4*e^2 + 3*b^2*c*d^2*x^2*e + b^2*c*d^3)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^2*e + d)/(a^2*x^6*e^3 + 3*a^2*d*x^4*e^2 + 3*a^2*d^2*x^2*e +
 a^2*d^3 + (b^2*x^6*e^3 + 3*b^2*d*x^4*e^2 + 3*b^2*d^2*x^2*e + b^2*d^3)*arcs
in(c*x)^2 + 2*(a*b*x^6*e^3 + 3*a*b*d*x^4*e^2 + 3*a*b*d^2*x^2*e + a*b*d^3)*a
rcsin(c*x)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}{\left(cx \right)}\right)^{2} \left(d + ex^{2}\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x**2)**(5/2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\operatorname{asin}(c\,x))^2\,(e\,x^2+d)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(5/2)), x)
```

3.686 $\int (d+ex^2)^2 \sqrt{a+b\mathbf{ArcSin}(cx)}\, dx$

Optimal. Leaf size=754

$$d^2x\sqrt{a+b\text{ArcSin}(cx)}+\frac{2}{3}dex^3\sqrt{a+b\text{ArcSin}(cx)}+\frac{1}{5}e^2x^5\sqrt{a+b\text{ArcSin}(cx)}-\frac{\sqrt{b}\,d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\cdots\right.}{c}$$

```
[Out] -1/800*e^2*cos(5*a/b)*FresnelS(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^
(1/2))*b^(1/2)*10^(1/2)*Pi^(1/2)/c^5+1/800*e^2*FresnelC(10^(1/2)/Pi^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/b)*b^(1/2)*10^(1/2)*Pi^(1/2)/c^5+1/
36*d*e*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*b^(1/2)*6^(1/2)*Pi^(1/2)/c^3+1/96*e^2*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*6^(1/2)*Pi^(1/2)/c^5-1/36*d*e*Fr
esnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)
*6^(1/2)*Pi^(1/2)/c^3-1/96*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/c^5-1/2*d^2*cos(a/b)*Fre
snelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^
(1/2)/c-1/4*d*e*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/c^3-1/16*e^2*cos(a/b)*FresnelS(2^(1/2)/Pi
^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/c^5+1/2*d^
2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/
2)*2^(1/2)*Pi^(1/2)/c+1/4*d*e*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(
1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/c^3+1/16*e^2*FresnelC(2^(1/
2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1
/2)/c^5+d^2*x*(a+b*arcsin(c*x))^(1/2)+2/3*d*e*x^3*(a+b*arcsin(c*x))^(1/2)+1
/5*e^2*x^5*(a+b*arcsin(c*x))^(1/2)
```

Rubi [A]
time = 1.50, antiderivative size = 754, normalized size of antiderivative = 1.00, number of steps used = 42, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.454$, Rules used = {4757, 4715, 4809, 3387, 3386, 3432, 3385, 3433, 4725, 3393}

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] d^2*x*Sqrt[a + b*ArcSin[c*x]] + (2*d*e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 + (e^
2*x^5*Sqrt[a + b*ArcSin[c*x]])/5 - (Sqrt[b]*d^2*Sqrt[Pi/2]*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c - (Sqrt[b]*d*e*Sqrt[Pi/2
]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c^3)
- (Sqrt[b]*e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
```

```
*x]])/Sqrt[b]])/(8*c^5) + (Sqrt[b]*d*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sq
rt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(6*c^3) + (Sqrt[b]*e^2*Sqrt[Pi/
6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16
*c^5) - (Sqrt[b]*e^2*Sqrt[Pi/10]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(80*c^5) + (Sqrt[b]*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sqrt[b]*d*e*Sqrt[
Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c
^3) + (Sqrt[b]*e^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])
/Sqrt[b]]*Sin[a/b])/(8*c^5) - (Sqrt[b]*d*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*
Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(6*c^3) - (Sqrt[b]*e^2*Sqrt
[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])
/(16*c^5) + (Sqrt[b]*e^2*Sqrt[Pi/10]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(80*c^5)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\sin^{-1}(cx)}\, dx = \int \left(d^2\sqrt{a+b\sin^{-1}(cx)} + 2dex^2\sqrt{a+b\sin^{-1}(cx)} + e^2x^4\sqrt{a+b\sin$$

$$= d^2 \int \sqrt{a+b\sin^{-1}(cx)}\, dx + (2de)\int x^2\sqrt{a+b\sin^{-1}(cx)}\, dx + e^2 \int x$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)} + \frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\sin^-$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)} + \frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\sin^-$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)} + \frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\sin^-$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)} + \frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\sin^-$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)} + \frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\sin^-$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)} + \frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\sin^-$$

$$= d^2x\sqrt{a+b\sin^{-1}(cx)} + \frac{2}{3}dex^3\sqrt{a+b\sin^{-1}(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\sin^-$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.96, size = 400, normalized size = 0.53

$$\frac{be^{-\frac{5ia}{b}}\left(450(8c^4d^2+4c^2de+e^2)e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+450(8c^4d^2+4c^2de+e^2)e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)-e\left(25\sqrt{3}(8c^2d+3e)e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)+25\sqrt{3}(8c^2d+3e)e^{\frac{8ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)-9\sqrt{5}e\left(\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},-\frac{5i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{10ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},\frac{5i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)\right)}{7200c^5\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (b*(450*(8*c^4*d^2 + 4*c^2*d*e + e^2)*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*Arc
Sin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 450*(8*c^4*d^2 + 4
```

```
*c^2*d*e + e^2)*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2,
(I*(a + b*ArcSin[c*x]))/b] - e*(25*Sqrt[3]*(8*c^2*d + 3*e)*E^(((2*I)*a)/b)*
Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x]))/
b] + 25*Sqrt[3]*(8*c^2*d + 3*e)*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x])
)/b]*Gamma[3/2, ((3*I)*(a + b*ArcSin[c*x]))/b] - 9*Sqrt[5]*e*(Sqrt[((-I)*(a
 + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] + E^(((10*
I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((5*I)*(a + b*ArcSin[c*
x]))/b]))))/(7200*c^5*E^(((5*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.80, size = 1155, normalized size = 1.53

method	result	size
default	Expression too large to display	1155

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/7200/c^5*(-200*2^(1/2)*(-3/b)^(1/2)*Pi^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2
)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*
b*c^2*d*e-200*2^(1/2)*(-3/b)^(1/2)*Pi^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/P
i^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*c
^2*d*e-75*2^(1/2)*(-3/b)^(1/2)*Pi^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1
/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*e^2-7
5*2^(1/2)*(-3/b)^(1/2)*Pi^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/
b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*e^2+1200*arcs
in(c*x)*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*b*c^2*d*e+1200*sin(-3*(a+b*arcsin
(c*x))/b+3*a/b)*a*c^2*d*e+450*arcsin(c*x)*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)
*b*e^2+450*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*a*e^2+3600*(-1/b)^(1/2)*2^(1/2
)*Pi^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*c^4*d^2+3600*(-1/b)^(1/2)*2^(1/2)*Pi^(
1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*(a+b*arcsin(c*x))^(1/2)*b*c^4*d^2+1800*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*c
os(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(
a+b*arcsin(c*x))^(1/2)*b*c^2*d*e+1800*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*sin(a/b
)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*ar
csin(c*x))^(1/2)*b*c^2*d*e-7200*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b
*c^4*d^2+450*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*e^2+45
0*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(
1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*e^2-7200*sin(-(a+
b*arcsin(c*x))/b+a/b)*a*c^4*d^2-3600*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a
/b)*b*c^2*d*e-3600*sin(-(a+b*arcsin(c*x))/b+a/b)*a*c^2*d*e-900*arcsin(c*x)*
sin(-(a+b*arcsin(c*x))/b+a/b)*b*e^2-900*sin(-(a+b*arcsin(c*x))/b+a/b)*a*e^2
+9*(-5/b)^(1/2)*2^(1/2)*Pi^(1/2)*cos(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/2)/(-5
```

```
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*e^2+9*(-5/b)
^(1/2)*2^(1/2)*Pi^(1/2)*sin(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)
*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*e^2-90*arcsin(c*x)*si
n(-5*(a+b*arcsin(c*x))/b+5*a/b)*b*e^2-90*sin(-5*(a+b*arcsin(c*x))/b+5*a/b)*
a*e^2)/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((x^2*e + d)^2*sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a + b \operatorname{asin}{(cx)}} \left(d + ex^2\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))*(d + e*x**2)**2, x)
```

Giac [C] Result contains complex when optimal does not.
time = 1.66, size = 3216, normalized size = 4.27

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/480*(240*sqrt(2)*sqrt(pi)*a*b*c^4*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*
x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*
e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 120*I*sqrt(2)*sqrt(pi)*b^
2*c^4*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqr
t(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b))
+ b*sqrt(abs(b))) + 240*sqrt(2)*sqrt(pi)*a*b*c^4*d^2*erf(1/2*I*sqrt(2)*sqrt
(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt
(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 120*I*sqrt(
2)*sqrt(pi)*b^2*c^4*d^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^
2/sqrt(abs(b)) + b*sqrt(abs(b))) - 480*sqrt(pi)*a*c^4*d^2*erf(-1/2*I*sqrt(2
)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a
)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)
)) - 480*sqrt(pi)*a*c^4*d^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(
abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-
I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) + 120*sqrt(2)*sqrt(pi)*a*b
*c^2*d*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) +
 b*sqrt(abs(b))) + 60*I*sqrt(2)*sqrt(pi)*b^2*c^2*d*e*erf(-1/2*I*sqrt(2)*sqr
t(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqr
t(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 120*sqrt(2)*
sqrt(pi)*a*b*c^2*d*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b))
 - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/s
qrt(abs(b)) + b*sqrt(abs(b))) - 60*I*sqrt(2)*sqrt(pi)*b^2*c^2*d*e*erf(1/2*I
*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c
*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))
- 240*I*sqrt(b*arcsin(c*x) + a)*c^4*d^2*e^(I*arcsin(c*x)) + 240*I*sqrt(b*ar
csin(c*x) + a)*c^4*d^2*e^(-I*arcsin(c*x)) - 240*sqrt(pi)*a*sqrt(b)*c^2*d*e*
erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arc
sin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)
) - 40*I*sqrt(pi)*b^(3/2)*c^2*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/
sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)
/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 240*sqrt(pi)*a*sqrt(b)*c^2*d*e*erf(-1
/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*
x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 4
0*I*sqrt(pi)*b^(3/2)*c^2*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(
b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sq
rt(6)*b - I*sqrt(6)*b^2/abs(b)) + 240*sqrt(pi)*a*c^2*d*e*erf(-1/2*sqrt(6)*s
qrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt
(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) - 240*
sqrt(pi)*a*c^2*d*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*
b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 240*sqrt(pi)*a*c^2*d*e*erf(1/2*I*s
qrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x
) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt
```

```
(abs(b))) + 240*sqrt(pi)*a*c^2*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)
/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/
b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) + 30*sqrt(2)*sqrt(pi)*a*b*e
^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sq
rt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqr
t(abs(b))) + 15*I*sqrt(2)*sqrt(pi)*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin
(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/
b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 30*sqrt(2)*sqrt(pi)*a*
b*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*
sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b
*sqrt(abs(b))) - 15*I*sqrt(2)*sqrt(pi)*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arc
sin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b
))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 40*I*sqrt(b*arcsi
n(c*x) + a)*c^2*d*e*e^(3*I*arcsin(c*x)) - 120*I*sqrt(b*arcsin(c*x) + a)*c^2
*d*e*e^(I*arcsin(c*x)) + 120*I*sqrt(b*arcsin(c*x) + a)*c^2*d*e*e^(-I*arcsin
(c*x)) - 40*I*sqrt(b*arcsin(c*x) + a)*c^2*d*e*e^(-3*I*arcsin(c*x)) - 15*sqr
t(6)*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b
) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(b +
I*b^2/abs(b)) - 15*sqrt(6)*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*a
rcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs
(b))*e^(-3*I*a/b)/(b - I*b^2/abs(b)) + 30*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*s
qrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I...
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}\,\,{\left(e\,x^2+d\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2, x)
```

3.687 $\int (d+ex^2)\sqrt{a+b\mathbf{ArcSin}(cx)}\,dx$

Optimal. Leaf size=369

$$dx\sqrt{a+b\text{ArcSin}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\text{ArcSin}(cx)}-\frac{\sqrt{b}\,d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{c}-\sqrt{b}\,\cdots$$

[Out] 1/72*e*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*6^(1/2)*Pi^(1/2)/c^3-1/72*e*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/c^3-1/2*d*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/c-1/8*e*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/c^3+1/2*d*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/c+1/8*e*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/c^3+d*x*(a+b*arcsin(c*x))^(1/2)+1/3*e*x^3*(a+b*arcsin(c*x))^(1/2)

Rubi [A]
time = 0.64, antiderivative size = 369, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4757, 4715, 4809, 3387, 3386, 3432, 3385, 3433, 4725, 3393}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\,e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4c^3}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{b}\,e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{12c^3}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\,e\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4c^3}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{b}\,e\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{12c^3}+\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\,d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{c}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\,d\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{c}+dx\sqrt{a+b\text{ArcSin}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\text{ArcSin}(cx)}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x^2)*Sqrt[a + b*ArcSin[c*x]],x]

[Out] d*x*Sqrt[a + b*ArcSin[c*x]] + (e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 - (Sqrt[b]*d*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c - (Sqrt[b]*e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*c^3) + (Sqrt[b]*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(12*c^3) + (Sqrt[b]*d*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sqrt[b]*e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(4*c^3) - (Sqrt[b]*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(12*c^3)

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
```

, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)\sqrt{a+b\sin^{-1}(cx)}\,dx = \int \left(d\sqrt{a+b\sin^{-1}(cx)}+ex^2\sqrt{a+b\sin^{-1}(cx)}\right)dx$$

$$= d\int \sqrt{a+b\sin^{-1}(cx)}\,dx + e\int x^2\sqrt{a+b\sin^{-1}(cx)}\,dx$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{1}{2}(bcd)\int \frac{}{\sqrt{1-c^2x^2}}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{(bd)\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+b}}\right.}{2c}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{(be)\text{Subst}\left(\int\left(\frac{3\sin}{4\sqrt{a-}}\right.\right.}{}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}+\frac{(be)\text{Subst}\left(\int \frac{\sin(3x)}{\sqrt{a+b}}\right.}{24c}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}\,d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S}{}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}\,d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S}{}$$

$$= dx\sqrt{a+b\sin^{-1}(cx)}+\frac{1}{3}ex^3\sqrt{a+b\sin^{-1}(cx)}-\frac{\sqrt{b}\,d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.35, size = 244, normalized size = 0.66

$$\frac{be^{-\frac{3ia}{b}}\left(9(4c^2d+e)e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{3}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+9(4c^2d+e)e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{3}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)-\sqrt{3}\,e\left(\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{3}{2},-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{3}{2},\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)}{72c^3\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (b*(9*(4*c^2*d + e)*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamm
a[3/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 9*(4*c^2*d + e)*E^(((4*I)*a)/b)*Sqrt
[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]
*e*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x
]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((3*I)*
(a + b*ArcSin[c*x]))/b])))/(72*c^3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.39, size = 555, normalized size = 1.50

method	result
default	$-\frac{-36\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\mathrm{S}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b\,c^2d-36\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/72/c^3*(-36*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/
b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*
d-36*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*Fresnel
C(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d+(-3/b)^(
1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)
/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e+(-3/b)^(1/2)*Pi^(1/2)
*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e-9*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a
+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*
arcsin(c*x))^(1/2)/b)*b*e-9*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))
^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1
/2)/b)*b*e+72*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b*c^2*d+72*sin(-(a+
b*arcsin(c*x))/b+a/b)*a*c^2*d+18*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*
b*e-6*arcsin(c*x)*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*b*e+18*sin(-(a+b*arcsin
(c*x))/b+a/b)*a*e-6*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*a*e)/(a+b*arcsin(c*x)
)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((x^2*e + d)*sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a + b \operatorname{asin}{(cx)}} \left(d + ex^2\right) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))*(d + e*x**2), x)
```

Giac [C] Result contains complex when optimal does not.
time = 1.20, size = 1661, normalized size = 4.50

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*sqrt(pi)*a*b^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(
(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*b^3*d*e
rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt
(abs(b)))*c) + 1/2*sqrt(2)*sqrt(pi)*a*b^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin
(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/
b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) - 1/4*I*sqrt(2)*
sqrt(pi)*b^3*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(a
bs(b)) + b^2*sqrt(abs(b)))*c) - sqrt(pi)*a*b*d*erf(-1/2*I*sqrt(2)*sqrt(b*ar
csin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(
b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c)
- sqrt(pi)*a*b*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1
/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*
b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c) + 1/8*sqrt(2)*sqrt(pi)*a*b^2*
```

```
e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqr
t(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*s
qrt(abs(b)))*c^3) + 1/16*I*sqrt(2)*sqrt(pi)*b^3*e*erf(-1/2*I*sqrt(2)*sqrt(b
*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(a
bs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) + 1/8*sqr
t(2)*sqrt(pi)*a*b^2*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)
) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3
/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) - 1/16*I*sqrt(2)*sqrt(pi)*b^3*e*erf(
1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arc
sin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(a
bs(b)))*c^3) - 1/4*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x)
 + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*
I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*c^3) - 1/24*I*sqrt(pi)*b^(5/2)
*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*
arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/
abs(b))*c^3) - 1/4*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x)
 + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3
*I*a/b)/((sqrt(6)*b^2 - I*sqrt(6)*b^3/abs(b))*c^3) + 1/24*I*sqrt(pi)*b^(5/2
)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b
*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^2 - I*sqrt(6)*b^
3/abs(b))*c^3) - 1/2*I*sqrt(b*arcsin(c*x) + a)*d*e^(I*arcsin(c*x))/c + 1/2*
I*sqrt(b*arcsin(c*x) + a)*d*e^(-I*arcsin(c*x))/c + 1/4*sqrt(pi)*a*b*e*erf(-
1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c
*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^(3/2) + I*sqrt(6)*b^(5/2)/
abs(b))*c^3) - 1/4*sqrt(pi)*a*b*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a
/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c^3) - 1/4*sqrt(
pi)*a*b*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqr
t(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c^3) + 1/4*sqrt(pi)*a*b*e*erf(-1/2*sqrt
(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)
*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^(3/2) - I*sqrt(6)*b^(5/2)/abs(b))
*c^3) + 1/24*I*sqrt(b*arcsin(c*x) + a)*e*e^(3*I*arcsin(c*x))/c^3 - 1/8*I*sq
rt(b*arcsin(c*x) + a)*e*e^(I*arcsin(c*x))/c^3 + 1/8*I*sqrt(b*arcsin(c*x) +
a)*e*e^(-I*arcsin(c*x))/c^3 - 1/24*I*sqrt(b*arcsin(c*x) + a)*e*e^(-3*I*arcs
in(c*x))/c^3
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(1/2)*(d + e*x^2),x)
[Out] int((a + b*asin(c*x))^(1/2)*(d + e*x^2), x)
```

3.688 $\int \sqrt{a+b\text{ArcSin}(cx)}\,dx$

Optimal. Leaf size=120

$$x\sqrt{a+b\text{ArcSin}(cx)}-\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{c}+\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{A}}}{\sqrt{b}}\right.}{c}$$

```
[Out] -1/2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^
(1/2)*2^(1/2)*Pi^(1/2)/c+1/2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1
/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/c+x*(a+b*arcsin(c*x))^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.583$, Rules used = {4715, 4809, 3387, 3386, 3432, 3385, 3433}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{c}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{c}+x\sqrt{a+b\text{ArcSin}(cx)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] x*Sqrt[a + b*ArcSin[c*x]] - (Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/P
i]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqr
t[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
```

```
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \sqrt{a+b\sin^{-1}(cx)}\,dx = x\sqrt{a+b\sin^{-1}(cx)} - \frac{1}{2}(bc)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

$$= x\sqrt{a+b\sin^{-1}(cx)} - \frac{b\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2c}$$

$$= x\sqrt{a+b\sin^{-1}(cx)} - \frac{\left(b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2c} + \frac{\left(b\sin\left(\right.\right.}{}$$

$$= x\sqrt{a+b\sin^{-1}(cx)} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{c} + \frac{\sin}{}$$

$$= x\sqrt{a+b\sin^{-1}(cx)} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{c} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.07, size = 119, normalized size = 0.99

$$\frac{be^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{3}{2}, -\frac{i(a+b\text{ArcSin}(cx))}{b}\right) + e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{3}{2}, \frac{i(a+b\text{ArcSin}(cx))}{b}\right)\right)}{2c\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]],x]
[Out] (b*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x])
)/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a + b
*ArcSin[c*x]))/b]))/(2*c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.02, size = 187, normalized size = 1.56

method	result
default	$-\frac{-\sqrt{2}\sqrt{\pi}\sqrt{-\frac{1}{b}}\sqrt{a+b\arcsin(cx)}\cos\left(\frac{a}{b}\right)\mathrm{S}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)b-\sqrt{2}\sqrt{\pi}\sqrt{-\frac{1}{b}}\sqrt{a+}}{2c\sqrt{a-}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/c/(a+b*arcsin(c*x))^(1/2)*(-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(
c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x
))^(1/2)/b)*b-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b
)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b+2*arc
sin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b+2*sin(-(a+b*arcsin(c*x))/b+a/b)*a)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a + b \operatorname{asin}(cx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x)), x)
```

Giac [C] Result contains complex when optimal does not.
time = 0.62, size = 531, normalized size = 4.42

$$\frac{\sqrt{2}\sqrt{\pi}ab\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{2\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c}+\frac{i\sqrt{2}\sqrt{\pi}b^2\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c}+\frac{\sqrt{2}\sqrt{\pi}ab\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{2\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c}-\frac{i\sqrt{2}\sqrt{\pi}b^2\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c}-\frac{\sqrt{\pi}a\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{c\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}-\frac{\sqrt{\pi}a\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{c\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}-\frac{i\sqrt{b\arcsin(cx)+a}\,e^{\left(i\arcsin(cx)\right)}}{2c}+\frac{i\sqrt{b\arcsin(cx)+a}\,e^{\left(-i\arcsin(cx)\right)}}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*sqrt(pi)*a*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(ab
s(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b
^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*b^2*erf(-1/2*
I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(
c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*
c) + 1/2*sqrt(2)*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/
((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - 1/4*I*sqrt(2)*sqrt(pi)*b^2*erf
(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(ab
s(b)))*c) - sqrt(pi)*a*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*s
qrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*a*erf(1/2*I*sqrt(
2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
a)*sqrt(abs(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(
abs(b)))) - 1/2*I*sqrt(b*arcsin(c*x) + a)*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(
b*arcsin(c*x) + a)*e^(-I*arcsin(c*x))/c
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{a + b\,\mathrm{asin}\,(c\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^(1/2), x)
```

3.689 $\int \frac{\sqrt{a+b\text{ArcSin}(cx)}}{d+ex^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\sqrt{a+b\text{ArcSin}(cx)}}{d+ex^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{a+b\text{ArcSin}(cx)}}{d+ex^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2),x]
[Out] Defer[Int][Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2), x]
```

Rubi steps

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2}\,dx = \int \frac{\sqrt{a+b\sin^{-1}(cx)}}{d+ex^2}\,dx$$

Mathematica [A]
time = 6.58, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\text{ArcSin}(cx)}}{d+ex^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2),x]
[Out] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2), x]
```

Maple [A]
time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
```

```
[Out] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(x^2*e + d), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a + b \operatorname{asin}{\left(cx \right)}}}{d + ex^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(1/2)/(e*x**2+d),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))/(d + e*x**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(1/2)/(d + e*x^2),x)
[Out] int((a + b*asin(c*x))^(1/2)/(d + e*x^2), x)
```

3.690 $\int \frac{\sqrt{a+b\mathbf{ArcSin}(cx)}}{(d+ex^2)^2} dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{\sqrt{a+b\mathrm{ArcSin}(cx)}}{(d+ex^2)^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{a+b\mathrm{ArcSin}(cx)}}{(d+ex^2)^2} dx$$

Verification is not applicable to the result.

```
[In] Int[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2,x]
[Out] Defer[Int][Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2} dx = \int \frac{\sqrt{a+b\sin^{-1}(cx)}}{(d+ex^2)^2} dx$$

Mathematica [A]
time = 13.56, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\mathrm{ArcSin}(cx)}}{(d+ex^2)^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2,x]
[Out] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2, x]
```

Maple [A]
time = 1.59, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(e\,x^2+d)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
[Out] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="maxima")
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(x^2*e + d)^2, x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a + b \operatorname{asin}{(cx)}}}{(d + ex^2)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(1/2)/(e*x**2+d)**2,x)
[Out] Integral(sqrt(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(e*x^2 + d)^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{a+b\operatorname{asin}\left(c\,x\right)}}{{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(1/2)/(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))^(1/2)/(d + e*x^2)^2, x)
```

3.691 $\int (d+ex^2)(a+b\text{ArcSin}(cx))^{3/2}\,dx$

Optimal. Leaf size=482

$$\frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{3c^3}+\frac{bex^2\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{6c}$$

```
[Out] d*x*(a+b*arcsin(c*x))^(3/2)+1/3*e*x^3*(a+b*arcsin(c*x))^(3/2)+1/144*b^(3/2)
*e*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^
(1/2)*Pi^(1/2)/c^3+1/144*b^(3/2)*e*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*
x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/c^3-3/4*b^(3/2)*d*cos(a/b)*F
resnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/
c-3/16*b^(3/2)*e*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)
/b^(1/2))*2^(1/2)*Pi^(1/2)/c^3-3/4*b^(3/2)*d*FresnelS(2^(1/2)/Pi^(1/2)*(a+b
*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c-3/16*b^(3/2)*e*Fre
snelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi
^(1/2)/c^3+3/2*b*d*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^(1/2)/c+1/3*b*e*(-c
^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^(1/2)/c^3+1/6*b*e*x^2*(-c^2*x^2+1)^(1/2)*
(a+b*arcsin(c*x))^(1/2)/c
```

Rubi [A]
time = 0.95, antiderivative size = 482, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 13, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.650$, Rules used = {4757, 4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433, 4725, 4795, 4731, 4491}

$$-\frac{3\sqrt{\frac{\pi}{2}}\,b^{3/2}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8c^3}+\frac{\sqrt{\frac{\pi}{6}}\,b^{3/2}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{24c^3}-\frac{3\sqrt{\frac{\pi}{2}}\,b^{3/2}e\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8c^3}+\frac{\sqrt{\frac{\pi}{6}}\,b^{3/2}e\sin\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{24c^3}-\frac{3\sqrt{\frac{\pi}{2}}\,b^{3/2}d\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2c}-\frac{3\sqrt{\frac{\pi}{2}}\,b^{3/2}d\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2c}+\frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{2c}+\frac{bex^2\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{6c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{3c^3}+dx(a+b\text{ArcSin}(cx))^{3/2}+\frac{1}{3}ex^3(a+b\text{ArcSin}(cx))^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (3*b*d*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + (b*e*Sqrt[1 - c^2
*x^2]*Sqrt[a + b*ArcSin[c*x]])/(3*c^3) + (b*e*x^2*Sqrt[1 - c^2*x^2]*Sqrt[a
+ b*ArcSin[c*x]])/(6*c) + d*x*(a + b*ArcSin[c*x])^(3/2) + (e*x^3*(a + b*Arc
Sin[c*x])^(3/2))/3 - (3*b^(3/2)*d*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*
Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*Cos[a/b]
*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*c^3) + (b^(3/2)
*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sq
rt[b]])/(24*c^3) - (3*b^(3/2)*d*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*FresnelS[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(8*c^3) + (b^(3/2)*e
*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a
)/b])/(24*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
```

```
, n}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\int \left(d+ex^2\right) \left(a+b\sin^{-1}(cx)\right)^{3/2} \, dx = \int \left(d\left(a+b\sin^{-1}(cx)\right)^{3/2}+ex^2\left(a+b\sin^{-1}(cx)\right)^{3/2}\right) \, dx$$

$$= d\int \left(a+b\sin^{-1}(cx)\right)^{3/2} \, dx + e\int x^2\left(a+b\sin^{-1}(cx)\right)^{3/2} \, dx$$

$$= dx\left(a+b\sin^{-1}(cx)\right)^{3/2}+\frac{1}{3}ex^3\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{1}{2}(3bcd)\int \frac{x\sqrt{a}}{\sqrt{}}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{bex^2\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{6c}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{3c^3}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{3c^3}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{3c^3}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{3c^3}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{3c^3}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}{3c^3}$$

Mathematica [C] Result contains complex when optimal does not.
time = 8.70, size = 873, normalized size = 1.81

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (a*b*d*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c
*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a
 + b*ArcSin[c*x]))/b]))/(2*c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]]) + (a*b*e*
(9*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a +
 b*ArcSin[c*x]))/b] + 9*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gam
ma[3/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*(Sqrt[((-I)*(a + b*ArcSin[c*x]
))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*
(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((3*I)*(a + b*ArcSin[c*x]))/b])))/(72*c^
3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]]) + (b*d*(2*Sqrt[a + b*ArcSin[c*x]
]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) - Sqrt[b^(-1)]*Sqrt[2*Pi]*Fresn
elC[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(3*b*Cos[a/b] + 2*a*Si
n[a/b]) + Sqrt[b^(-1)]*Sqrt[2*Pi]*FresnelS[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c*x]]]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*c) + (b*e*(18*Sqrt[a +
b*ArcSin[c*x]]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) - 9*Sqrt[b^(-1)]*S
qrt[2*Pi]*FresnelC[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(3*b*Co
s[a/b] + 2*a*Sin[a/b]) + 9*Sqrt[b^(-1)]*Sqrt[2*Pi]*FresnelS[Sqrt[b^(-1)]*Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(2*a*Cos[a/b] - 3*b*Sin[a/b]) + Sqrt[b^(-
1)]*Sqrt[6*Pi]*FresnelC[Sqrt[b^(-1)]*Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(b
*Cos[(3*a)/b] + 2*a*Sin[(3*a)/b]) + Sqrt[b^(-1)]*Sqrt[6*Pi]*FresnelS[Sqrt[b
^(-1)]*Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(-2*a*Cos[(3*a)/b] + b*Sin[(3*a)
/b]) - 6*Sqrt[a + b*ArcSin[c*x]]*(Cos[3*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[3*
ArcSin[c*x]])))/(144*c^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 849 vs. $2(374) = 748$.
time = 0.47, size = 850, normalized size = 1.76

method	result
default	$-\frac{108\sqrt{2}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{\pi}\,b^2c^2d-108\sqrt{2}\,\sqrt{-}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/144/c^3*(108*2^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*Fresn
elC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*b^2*c
^2*d-108*2^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelS(2^(
1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*b^2*c^2*d+27
*2^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^
```

```
(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*b^2*e-27*2^(1/2)*(-1
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)
^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*b^2*e-2^(1/2)*(a+b*arcsin(c*x))^
(1/2)*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))
^(1/2)/b)*Pi^(1/2)*(-3/b)^(1/2)*b^2*e+2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3
*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*P
i^(1/2)*(-3/b)^(1/2)*b^2*e+144*arcsin(c*x)^2*sin(-(a+b*arcsin(c*x))/b+a/b)*
b^2*c^2*d+288*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*a*b*c^2*d-216*arcsi
n(c*x)*cos(-(a+b*arcsin(c*x))/b+a/b)*b^2*c^2*d+36*arcsin(c*x)^2*sin(-(a+b*a
rcsin(c*x))/b+a/b)*b^2*e-12*arcsin(c*x)^2*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)
*b^2*e+144*sin(-(a+b*arcsin(c*x))/b+a/b)*a^2*c^2*d-216*cos(-(a+b*arcsin(c*x
))/b+a/b)*a*b*c^2*d+72*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*a*b*e-54*a
rcsin(c*x)*cos(-(a+b*arcsin(c*x))/b+a/b)*b^2*e-24*arcsin(c*x)*sin(-3*(a+b*a
rcsin(c*x))/b+3*a/b)*a*b*e+6*arcsin(c*x)*cos(-3*(a+b*arcsin(c*x))/b+3*a/b)*
b^2*e+36*sin(-(a+b*arcsin(c*x))/b+a/b)*a^2*e-54*cos(-(a+b*arcsin(c*x))/b+a/
b)*a*b*e-12*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*a^2*e+6*cos(-3*(a+b*arcsin(c*
x))/b+3*a/b)*a*b*e)/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((x^2*e + d)*(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b \operatorname{asin}{(cx)})^{\frac{3}{2}} \left(d + ex^2\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x**2+d)*(a+b*asin(c*x))**(3/2),x)

[Out] Integral((a + b*asin(c*x))**(3/2)*(d + e*x**2), x)

Giac [C] Result contains complex when optimal does not.
time = 1.76, size = 2814, normalized size = 5.84

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")

```
[Out] 1/96*(48*sqrt(2)*sqrt(pi)*a^2*b*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x)
 + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^
(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 48*I*sqrt(2)*sqrt(pi)*a*b^2
*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2
)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b
*sqrt(abs(b))) + 48*sqrt(2)*sqrt(pi)*a^2*b*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*a
rcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs
(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 48*I*sqrt(2)*sq
rt(pi)*a*b^2*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqr
t(abs(b)) + b*sqrt(abs(b))) - 48*I*sqrt(2)*sqrt(pi)*a*b*c^2*d*erf(-1/2*I*sq
rt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x)
 + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 36*sqrt
(2)*sqrt(pi)*b^2*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sq
rt(abs(b)) + sqrt(abs(b))) + 48*I*sqrt(2)*sqrt(pi)*a*b*c^2*d*erf(1/2*I*sqrt
(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
 a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 36*sqrt
(2)*sqrt(pi)*b^2*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/s
qrt(abs(b)) + sqrt(abs(b))) - 48*I*sqrt(b*arcsin(c*x) + a)*b*c^2*d*arcsin(c
*x)*e^(I*arcsin(c*x)) + 48*I*sqrt(b*arcsin(c*x) + a)*b*c^2*d*arcsin(c*x)*e^
(-I*arcsin(c*x)) - 96*sqrt(pi)*a^2*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c
*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)
*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 96*sqrt(pi)*
a^2*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(a
bs(b)) + sqrt(2)*sqrt(abs(b))) + 12*sqrt(2)*sqrt(pi)*a^2*b*e*erf(-1/2*I*sqr
t(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x)
+ a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 12*I
*sqrt(2)*sqrt(pi)*a*b^2*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(a
bs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b
^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 12*sqrt(2)*sqrt(pi)*a^2*b*e*erf(1/2*I*s
qrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x
```

```
) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) -
12*I*sqrt(2)*sqrt(pi)*a*b^2*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/
(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 48*I*sqrt(b*arcsin(c*x) + a)*a*c^2
*d*e^(I*arcsin(c*x)) + 72*sqrt(b*arcsin(c*x) + a)*b*c^2*d*e^(I*arcsin(c*x))
 + 48*I*sqrt(b*arcsin(c*x) + a)*a*c^2*d*e^(-I*arcsin(c*x)) + 72*sqrt(b*arcs
in(c*x) + a)*b*c^2*d*e^(-I*arcsin(c*x)) - 24*sqrt(pi)*a^2*sqrt(b)*e*erf(-1/
2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x
) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 8*I
*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/
2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b
+ I*sqrt(6)*b^2/abs(b)) - 12*I*sqrt(2)*sqrt(pi)*a*b*e*erf(-1/2*I*sqrt(2)*sq
rt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sq
rt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 9*sqrt(2)*sqrt(
pi)*b^2*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqr
t(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) +
sqrt(abs(b))) + 12*I*sqrt(2)*sqrt(pi)*a*b*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin
(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/
b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 9*sqrt(2)*sqrt(pi)*b^2*e
*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(
b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs
(b))) - 24*sqrt(pi)*a^2*sqrt(b)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/
sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b
)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 8*I*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sq
rt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) +
a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 4*I*sq
rt(b*arcsin(c*x) + a)*b*e*arcsin(c*x)*e^(3*I*arcsin(c*x)) - 12*I*sqrt(b*arc
sin(c*x) + a)*b*e*arcsin(c*x)*e^(I*arcsin(c*x)) + 12*I*sqrt(b*arcsin(c*x) +
 a)*b*e*arcsin(c*x)*e^(-I*arcsin(c*x)) - 4*I*sqrt(b*arcsin(c*x) + a)*b*e*ar
csin(c*x)*e^(-3*I*arcsin(c*x)) + 24*sqrt(pi)*a^2*e*erf(-1/2*sqrt(6)*sqrt(b*
arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/ab
s(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) + 8*I*sqrt(p
i)*a*b*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + ...
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{asin}(c\,x))^{3/2}\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(3/2)*(d + e*x^2),x)
[Out] int((a + b*asin(c*x))^(3/2)*(d + e*x^2), x)
```

3.692 $\int (a+b\textbf{ArcSin}(cx))^{3/2}\,dx$

Optimal. Leaf size=159

$$\frac{3b\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{2c}+x(a+b\text{ArcSin}(cx))^{3/2}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\,\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}}}{\sqrt{b}}\right.}{2c}$$

[Out] x*(a+b*arcsin(c*x))^(3/2)-3/4*b^(3/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c-3/4*b^(3/2)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c+3/2*b*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^(1/2)/c

Rubi [A]
time = 0.18, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433}

$$-\frac{3\sqrt{\frac{\pi}{2}}\,b^{3/2}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2c}-\frac{3\sqrt{\frac{\pi}{2}}\,b^{3/2}\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2c}+\frac{3b\sqrt{1-c^2x^2}\,\sqrt{a+b\text{ArcSin}(cx)}}{2c}+x(a+b\text{ArcSin}(cx))^{3/2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*ArcSin[c*x])^(3/2),x]

[Out] (3*b*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + x*(a + b*ArcSin[c*x])^(3/2) - (3*b^(3/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c)

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
```

```
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \left(a+b\sin^{-1}(cx)\right)^{3/2}\,dx = x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{1}{2}(3bc)\int \frac{x\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{1-c^2x^2}}\,dx$$

$$=\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{1}{4}(3b^2)\int \frac{}{\sqrt{a+b\sin}}$$

$$=\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{(3b)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\right.}{\sqrt{x}}\right.}{}$$

$$=\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}}{}$$

$$=\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}}{}$$

$$=\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\sin^{-1}(cx)}}{2c}+x\left(a+b\sin^{-1}(cx)\right)^{3/2}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)}{}$$

Mathematica [C] Result contains complex when optimal does not.
time = 1.87, size = 291, normalized size = 1.83

$$\frac{b\left(2\sqrt{a+b\text{ArcSin}(cx)}\left(3\sqrt{1-c^2x^2}+2cx\text{ArcSin}(cx)\right)+\frac{2ae^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\text{Gamma}\left(\frac{3}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)\right)}{\sqrt{a+b\text{ArcSin}(cx)}}-\sqrt{\frac{1}{b}}\sqrt{2\pi}\,\text{FresnelC}\left(\sqrt{\frac{1}{b}}\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}\right)\left(3b\cos\left(\frac{a}{b}\right)+2a\sin\left(\frac{a}{b}\right)\right)+\sqrt{\frac{1}{b}}\sqrt{2\pi}\,S\left(\sqrt{\frac{1}{b}}\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}\right)\left(2a\cos\left(\frac{a}{b}\right)-3b\sin\left(\frac{a}{b}\right)\right)\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (b*(2*Sqrt[a + b*ArcSin[c*x]]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) + (
2*a*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x]
))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a +
b*ArcSin[c*x]))/b]))/(E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]]) - Sqrt[b^(-1)]*S
qrt[2*Pi]*FresnelC[Sqrt[b^(-1)]*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(3*b*Co
s[a/b] + 2*a*Sin[a/b]) + Sqrt[b^(-1)]*Sqrt[2*Pi]*FresnelS[Sqrt[b^(-1)]*Sqrt
[2/Pi]*Sqrt[a + b*ArcSin[c*x]]]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*c)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 277 vs. $2(123) = 246$.
time = 0.00, size = 278, normalized size = 1.75

method	result
default	$-\frac{3\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b^{2}-3\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c*(3*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*Fr
esnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b^2-3*(-1/b
)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/
Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b^2+4*arcsin(c*x)^2*sin(-(
a+b*arcsin(c*x))/b+a/b)*b^2+8*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*a*b
-6*arcsin(c*x)*cos(-(a+b*arcsin(c*x))/b+a/b)*b^2+4*sin(-(a+b*arcsin(c*x))/b
+a/b)*a^2-6*cos(-(a+b*arcsin(c*x))/b+a/b)*a*b)/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\operatorname{asin}\left(cx\right)\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**(3/2), x)
```

Giac [C] Result contains complex when optimal does not.
time = 1.06, size = 993, normalized size = 6.25

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(
(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*e
rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt
(abs(b)))*c) + 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin
(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/
b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) - 1/2*I*sqrt(2)*
sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(a
bs(b)) + b^2*sqrt(abs(b)))*c) - 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqr
t(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x)
+ a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) +
3/8*sqrt(2)*sqrt(pi)*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(ab
s(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b
^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(1/2
*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin
(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)
))*c) + 3/8*sqrt(2)*sqrt(pi)*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/
sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/
b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - sqrt(pi)*a^2*b*erf(-1/2*I*s
qrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x
) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*s
qrt(abs(b)))*c) - sqrt(pi)*a^2*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/
sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/
b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c) - 1/2*I*sqrt(
b*arcsin(c*x) + a)*b*arcsin(c*x)*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(
c*x) + a)*b*arcsin(c*x)*e^(-I*arcsin(c*x))/c - 1/2*I*sqrt(b*arcsin(c*x) + a
)*a*e^(I*arcsin(c*x))/c + 3/4*sqrt(b*arcsin(c*x) + a)*b*e^(I*arcsin(c*x))/c
 + 1/2*I*sqrt(b*arcsin(c*x) + a)*a*e^(-I*arcsin(c*x))/c + 3/4*sqrt(b*arcsin
(c*x) + a)*b*e^(-I*arcsin(c*x))/c
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int (a + b\,\mathrm{asin}(c\,x))^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(3/2),x)
[Out] int((a + b*asin(c*x))^(3/2), x)
```

3.693 $\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{d+ex^2} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a+b\text{ArcSin}(cx))^{3/2}}{d+ex^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{d+ex^2} dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2),x]
[Out] Defer[Int][(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2), x]
```

Rubi steps

$$\int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2} dx = \int \frac{\left(a+b\sin^{-1}(cx)\right)^{3/2}}{d+ex^2} dx$$

Mathematica [A]
time = 2.25, size = 0, normalized size = 0.00

$$\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{d+ex^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2),x]
[Out] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2), x]
```

Maple [A]
time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^{\frac{3}{2}}}{e\,x^2+d} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
```

```
[Out] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(x^2*e + d), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{asin}(cx))^{\frac{3}{2}}}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(3/2)/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))**(3/2)/(d + e*x**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(e*x^2 + d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{(a + b\,\mathrm{asin}(c\,x))^{3/2}}{e\,x^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(3/2)/(d + e*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^(3/2)/(d + e*x^2), x)
```

3.694 $\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{(d+ex^2)^2} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a+b\text{ArcSin}(cx))^{3/2}}{(d+ex^2)^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{(d+ex^2)^2} dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2,x]
[Out] Defer[Int][(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{(a+b\sin^{-1}(cx))^{3/2}}{(d+ex^2)^2} dx = \int \frac{(a+b\sin^{-1}(cx))^{3/2}}{(d+ex^2)^2} dx$$

Mathematica [A]
time = 7.14, size = 0, normalized size = 0.00

$$\int \frac{(a+b\text{ArcSin}(cx))^{3/2}}{(d+ex^2)^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2,x]
[Out] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2, x]
```

Maple [A]
time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arcsin(cx))^{\frac{3}{2}}}{(e\,x^2+d)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
[Out] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(x^2*e + d)^2, x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{asin}(cx))^{\frac{3}{2}}}{(d + ex^2)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*asin(c*x))**(3/2)/(e*x**2+d)**2,x)
[Out] Integral((a + b*asin(c*x))**(3/2)/(d + e*x**2)**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(e*x^2 + d)^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^{3/2}}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*asin(c*x))^(3/2)/(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))^(3/2)/(d + e*x^2)^2, x)
```

3.695 $\int \frac{(d+ex^2)^2}{\sqrt{a+b\mathbf{ArcSin}(cx)}}\,dx$

Optimal. Leaf size=679

$$\frac{de\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c^3}+\frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right.}{4\sqrt{b}\,c^5}$$

```
[Out] 1/80*e^2*cos(5*a/b)*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1
/2))*10^(1/2)*Pi^(1/2)/c^5/b^(1/2)+1/80*e^2*FresnelS(10^(1/2)/Pi^(1/2)*(a+b
*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/c^5/b^(1/2)-1/6*d
*e*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^
(1/2)*Pi^(1/2)/c^3/b^(1/2)-1/6*d*e*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*
x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/c^3/b^(1/2)+1/2*d*e*cos(a/b)
*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2
)/c^3/b^(1/2)+1/8*e^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c^5/b^(1/2)+1/2*d*e*FresnelS(2^(1/2)/Pi^(1/
2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c^3/b^(1/2)+1
/8*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*
2^(1/2)*Pi^(1/2)/c^5/b^(1/2)-1/16*e^2*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*
(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/c^5/b^(1/2)-1/16*e^2*Fres
nelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*P
i^(1/2)/c^5/b^(1/2)+d^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c/b^(1/2)+d^2*FresnelS(2^(1/2)/Pi^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c/b^(1/2)
```

Rubi [A]

time = 0.98, antiderivative size = 679, normalized size of antiderivative = 1.00, number of steps used = 39, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.409$, Rules used = {4757, 4719, 3387, 3386, 3432, 3385, 3433, 4731, 4491}

$$\frac{\sqrt{\frac{\pi}{2}}e^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4\sqrt{b}\,c^5}-\frac{\sqrt{\frac{3\pi}{2}}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}\,c^5}+\frac{\sqrt{\frac{\pi}{10}}e^2\cos\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}\,c^5}+\frac{\sqrt{\frac{\pi}{2}}e^2\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{4\sqrt{b}\,c^5}-\frac{\sqrt{\frac{3\pi}{2}}e^2\sin\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}\,c^5}+\frac{\sqrt{\frac{\pi}{10}}e^2\sin\left(\frac{5a}{b}\right)S\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}\,c^5}+\frac{\sqrt{\frac{\pi}{2}}de\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c^3}-\frac{\sqrt{\frac{\pi}{6}}de\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c^3}+\frac{\sqrt{\frac{\pi}{2}}de\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c^3}-\frac{\sqrt{\frac{\pi}{6}}de\sin\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c^3}+\frac{\sqrt{2\pi}d^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}+\frac{\sqrt{2\pi}d^2\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (d*e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt
[b]])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*Cos[a/b]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (d*e*Sqrt
[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])
```

```
/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Cos[(5*a)
/b]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5
) + (d*e*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*
Sin[a/b])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*c) - (d*e*
Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)
/b])/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Fresn
elS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(8*Sqrt[b]
*c^5)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx = \int \left(\frac{d^2}{\sqrt{a+b\sin^{-1}(cx)}} + \frac{2dex^2}{\sqrt{a+b\sin^{-1}(cx)}} + \frac{e^2x^4}{\sqrt{a+b\sin^{-1}(cx)}}\right) dx$$

$$= d^2\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx + (2de)\int \frac{x^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx + e^2\int \frac{x^4}{\sqrt{a+b\sin^{-}}}$$

$$= \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{(2de)\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{\sqrt{a+bx}}\,dx, x, \sin\right.}{c^3}$$

$$= \frac{(2de)\text{Subst}\left(\int \left(\frac{\cos(x)}{4\sqrt{a+bx}} - \frac{\cos(3x)}{4\sqrt{a+bx}}\right) dx, x, \sin^{-1}(cx)\right)}{c^3} + \frac{e^2\text{Subst}\left(\int \left(\frac{}{8\sqrt{}}\right.\right.}{}$$

$$= \frac{(de)\text{Subst}\left(\int \frac{\cos(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{2c^3} - \frac{(de)\text{Subst}\left(\int \frac{\cos(3x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(\right.}{2c^3}$$

$$= \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c} + \frac{d^2\sqrt{2\pi}\,S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(}}{\sqrt{b}}\right.}{\sqrt{b}\,c}$$

$$= \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c} + \frac{d^2\sqrt{2\pi}\,S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(}}{\sqrt{b}}\right.}{\sqrt{b}\,c}$$

$$= \frac{de\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c^3} + \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+}}{\sqrt{}}\right.}{4\sqrt{b}\,c^5}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.99, size = 401, normalized size = 0.59

$$\frac{ie^{-\frac{5ia}{b}}\left(-30(8c^4d^2+4c^2de+e^2)e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+30(8c^4d^2+4c^2de+e^2)e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+e\left(5\sqrt{3}(8c^2d+3e)e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)-5\sqrt{3}(8c^2d+3e)e^{\frac{8ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)-3\sqrt{5}e\left(\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{5i(a+b\text{ArcSin}(cx))}{b}\right)-e^{\frac{10ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{5i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)\right)}{480c^5\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((I/480)*(-30*(8*c^4*d^2 + 4*c^2*d*e + e^2)*E^(((4*I)*a)/b)*Sqrt[((-I)*(a +
 b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 30*(8*c^4*d^
```

```
2 + 4*c^2*d*e + e^2)*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[
1/2, (I*(a + b*ArcSin[c*x]))/b] + e*(5*Sqrt[3]*(8*c^2*d + 3*e)*E^(((2*I)*a)
/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x
]))/b] - 5*Sqrt[3]*(8*c^2*d + 3*e)*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*
x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[5]*e*(Sqrt[((-I)
*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - E^(((
10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((5*I)*(a + b*ArcSin
[c*x]))/b]))))/(c^5*E^(((5*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.57, size = 664, normalized size = 0.98

method	result
default	$\frac{\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{5}{b}}\left(-48\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{5}{b}}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b\,c^{4}d^{2}+48\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{5}{b}}\,\mathrm{si}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/240/c^5*2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(-48*(-1/b)^(1/2)*(-5/b)^(1/2)*cos(
a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^
4*d^2+48*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b
)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^4*d^2-24*(-1/b)^(1/2)*(-5/b)^(1/2)*c
os(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b
*c^2*d*e+24*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-
1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d*e+8*(-3/b)^(1/2)*(-5/b)^(1/2)
*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*b*c^2*d*e-8*(-3/b)^(1/2)*(-5/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi
^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d*e-6*(-1/b)^(1/2)*(-5
/b)^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))
^(1/2)/b)*b*e^2+6*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e^2+3*(-3/b)^(1/2)*(-5/b)^(1/
2)*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1
/2)/b)*b*e^2-3*(-3/b)^(1/2)*(-5/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(
1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e^2+3*cos(5*a/b)*FresnelC(5*
2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2-3*sin(5*a/b)*F
resnelS(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((x^2*e + d)^2/sqrt(b*arcsin(c*x) + a), x)
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(d + ex^2)^2}{\sqrt{a + b\,\mathrm{asin}\,(cx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral((d + e*x**2)**2/sqrt(a + b*asin(c*x)), x)
```

Giac [**C**] Result contains complex when optimal does not.
time = 0.84, size = 975, normalized size = 1.44

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/
sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*d^2*erf(1/2*I*sqrt(2)*sqrt
(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt
(abs(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))
)) + 1/2*sqrt(pi)*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/
2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*s
qrt(b) + I*sqrt(6)*b^(3/2)/abs(b))*c^3) - 1/2*sqrt(pi)*d*e*erf(-1/2*I*sqrt(
2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
a)*sqrt(abs(b))/b)*e^(I*a/b)/(c^3*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(
abs(b)))) - 1/2*sqrt(pi)*d*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt
(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(
```

```
c^3*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/2*sqrt(pi)*d*e*
erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arc
sin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^
(3/2)/abs(b))*c^3) - 1/16*sqrt(pi)*e^2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x)
 + a)/sqrt(b) - 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(5
*I*a/b)/((sqrt(10)*sqrt(b) + I*sqrt(10)*b^(3/2)/abs(b))*c^5) - 1/8*sqrt(pi)
*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*
sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c^5*(I*sqrt(2)*b/sqrt(ab
s(b)) + sqrt(2)*sqrt(abs(b)))) - 1/8*sqrt(pi)*e^2*erf(1/2*I*sqrt(2)*sqrt(b*
arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(ab
s(b))/b)*e^(-I*a/b)/(c^5*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))
) - 1/16*sqrt(pi)*e^2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1
/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-5*I*a/b)/((sqrt(1
0)*sqrt(b) - I*sqrt(10)*b^(3/2)/abs(b))*c^5) + 3/16*sqrt(pi)*e^2*erf(-1/2*s
qrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) +
 a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(b)*c^5*(sqrt(6) + I*sqrt(6)*b/abs(b))
) + 3/16*sqrt(pi)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/
2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(b)*c
^5*(sqrt(6) - I*sqrt(6)*b/abs(b)))
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(e\,x^2+d\right)^2}{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^2/(a + b*asin(c*x))^(1/2),x)
```

```
[Out] int((d + e*x^2)^2/(a + b*asin(c*x))^(1/2), x)
```

3.696 $\int \frac{d+ex^2}{\sqrt{a+b\mathbf{ArcSin}(cx)}}\,dx$

Optimal. Leaf size=329

$$\frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}\,c^3}+\frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}$$

```
[Out] -1/12*e*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*6^(1/2)*Pi^(1/2)/c^3/b^(1/2)-1/12*e*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsi
n(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/c^3/b^(1/2)+1/4*e*cos(a/
b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1
/2)/c^3/b^(1/2)+1/4*e*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(
1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c^3/b^(1/2)+d*cos(a/b)*FresnelC(2^(1/2)/Pi^
(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c/b^(1/2)+d*Fresnel
S(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/
2)/c/b^(1/2)
```

Rubi [A]
time = 0.42, antiderivative size = 329, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.450$, Rules used = {4757, 4719, 3387, 3386, 3432, 3385, 3433, 4731, 4491}

$$\frac{\sqrt{\frac{\pi}{2}}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}\,c^3}-\frac{\sqrt{\frac{\pi}{6}}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}\,c^3}+\frac{\sqrt{\frac{\pi}{2}}e\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}\,c^3}-\frac{\sqrt{\frac{\pi}{6}}e\sin\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}\,c^3}+\frac{\sqrt{2\pi}d\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}+\frac{\sqrt{2\pi}d\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b
]])/(2*Sqrt[b]*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC
[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*Sqrt[b]*c^3) + (e*Sqrt[P
i/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*Sq
rt[b]*c^3) + (d*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sq
rt[b]]*Sin[a/b])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(2*Sqrt[b]*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
```

```
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$\int \frac{d+ex^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx = \int \left(\frac{d}{\sqrt{a+b\sin^{-1}(cx)}}+\frac{ex^2}{\sqrt{a+b\sin^{-1}(cx)}}\right)dx$$

$$= d\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx + e\int \frac{x^2}{\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

$$= \frac{d\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{e\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx\right.}{c^3}$$

$$= \frac{e\text{Subst}\left(\int \left(\frac{\cos(x)}{4\sqrt{a+bx}}-\frac{\cos(3x)}{4\sqrt{a+bx}}\right)dx, x, \sin^{-1}(cx)\right)}{c^3} + \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\right.}{}$$

$$= \frac{e\text{Subst}\left(\int \frac{\cos(x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{4c^3} - \frac{e\text{Subst}\left(\int \frac{\cos(3x)}{\sqrt{a+bx}}\,dx, x, \sin^{-1}(cx)\right)}{4c^3}$$

$$= \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c} + \frac{d\sqrt{2\pi}\,S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx\right.}}{\sqrt{b}}\right.}{\sqrt{b}\,c}$$

$$= \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c} + \frac{d\sqrt{2\pi}\,S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx\right.}}{\sqrt{b}}\right.}{\sqrt{b}\,c}$$

$$= \frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}\,c^3} + \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{s}}}{\sqrt{b}}\right.}{\sqrt{b}\,c}$$

<u>Mathematica</u> [C] Result contains complex when optimal does not.
time = 0.36, size = 246, normalized size = 0.75

$$-\frac{ie^{-\frac{3ia}{b}}\left(3(4c^2d+e)e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)-3(4c^2d+e)e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)-\sqrt{3}\,e\left(\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)-e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)}{24c^3\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((-1/24*I)*(3*(4*c^2*d + e)*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))
/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] - 3*(4*c^2*d + e)*E^(((4*I)*a)
/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] -
 Sqrt[3]*e*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*Ar
cSin[c*x]))/b] - E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
 ((3*I)*(a + b*ArcSin[c*x]))/b])))/(c^3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c
*x]])
```

Maple [A]
time = 0.30, size = 310, normalized size = 0.94

method	result
default	$-\frac{\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{3}{b}}\left(4\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{3}{b}}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b\,c^{2}d-4\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{3}{b}}\,\sin(\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/12/c^3*Pi^(1/2)*2^(1/2)*(-3/b)^(1/2)*(4*(-1/b)^(1/2)*(-3/b)^(1/2)*cos(a/
b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*
d-4*(-1/b)^(1/2)*(-3/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/
2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d+(-1/b)^(1/2)*(-3/b)^(1/2)*cos(a/b)*Fr
esnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e-(-1/b)^
(1/2)*(-3/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arc
sin(c*x))^(1/2)/b)*b*e+cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*
(a+b*arcsin(c*x))^(1/2)/b)*e-sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^
(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((x^2*e + d)/sqrt(b*arcsin(c*x) + a), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{d+ex^2}{\sqrt{a+b\operatorname{asin}(cx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral((d + e*x**2)/sqrt(a + b*asin(c*x)), x)
```

Giac [C] Result contains complex when optimal does not.
time = 0.69, size = 481, normalized size = 1.46

$$-\frac{\sqrt{\pi}\,d\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{c\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}-\frac{\sqrt{\pi}\,d\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{c\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}+\frac{\sqrt{\pi}\,e\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(cx)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(cx)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}+\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)c^3}-\frac{\sqrt{\pi}\,e\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4c^3\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}-\frac{\sqrt{\pi}\,e\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4c^3\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}+\frac{\sqrt{\pi}\,e\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(cx)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(cx)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}-\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*s
qrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/sq
rt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*d*erf(1/2*I*sqrt(2)*sqrt(b*a
rcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs
(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) +
 1/4*sqrt(pi)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sq
rt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*sqrt(b)
 + I*sqrt(6)*b^(3/2)/abs(b))*c^3) - 1/4*sqrt(pi)*e*erf(-1/2*I*sqrt(2)*sqrt(
b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(
abs(b))/b)*e^(I*a/b)/(c^3*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))
) - 1/4*sqrt(pi)*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(c^3*(-I*sq
rt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/4*sqrt(pi)*e*erf(-1/2*sqr
t(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a
)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)
)*c^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{e\,x^2+d}{\sqrt{a+b\operatorname{asin}(c\,x)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)/(a + b*asin(c*x))^(1/2),x)
[Out] int((d + e*x^2)/(a + b*asin(c*x))^(1/2), x)
```

3.697 $\int \frac{1}{\sqrt{a+b\mathbf{ArcSin}(cx)}}\,dx$

Optimal. Leaf size=101

$$\frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}+\frac{\sqrt{2\pi}\,S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}\,c}$$

```
[Out] cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)
*Pi^(1/2)/c/b^(1/2)+FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/
2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c/b^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4719, 3387, 3386, 3432, 3385, 3433}

$$\frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}+\frac{\sqrt{2\pi}\sin\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(Sqrt[b]*c) + (Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/S
qrt[b]]*Sin[a/b])/(Sqrt[b]*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rubi steps

$$\int \frac{1}{\sqrt{a+b\sin^{-1}(cx)}}\,dx = \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc}$$

$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\sin^{-1}(cx)\right)}{bc} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a\right.}{bc}$$

$$= \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\sin^{-1}(cx)}\right)}{bc} + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\right.}{}$$

$$= \frac{\sqrt{2\pi}\,\cos\left(\frac{a}{b}\right)C\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{\sqrt{b}\,c} + \frac{\sqrt{2\pi}\,S\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right.}{\sqrt{b}\,c}$$

Mathematica [C] Result contains complex when optimal does not.

time = 0.07, size = 121, normalized size = 1.20

$$\frac{ie^{-\frac{ia}{b}}\left(-\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)\right)}{2c\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

[In] Integrate[1/Sqrt[a + b*ArcSin[c*x]],x]

[Out] ((I/2)*(-(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b]) + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b]))/(c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]])

Maple [A]
time = 0.04, size = 90, normalized size = 0.89

method	result	si
default	$\frac{\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-\sin\left(\frac{a}{b}\right)\text{S}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\right)}{c}$	90

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)

[Out] 2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b))/c

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")

[Out] integrate(1/sqrt(b*arcsin(c*x) + a), x)

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a + b \operatorname{asin}{(cx)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*asin(c*x)), x)
```

Giac [C] Result contains complex when optimal does not.
time = 0.46, size = 159, normalized size = 1.57

$$-\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{c\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}-\frac{\sqrt{\pi}\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{c\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqr
t(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/sqrt
(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*erf(1/2*I*sqrt(2)*sqrt(b*arcsi
n(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))
/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\sqrt{a + b \operatorname{asin}(c\, x)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*asin(c*x))^(1/2),x)
```

```
[Out] int(1/(a + b*asin(c*x))^(1/2), x)
```

3.698 $\int \frac{1}{(d+ex^2)\sqrt{a+b\mathbf{ArcSin}(cx)}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+ex^2)\sqrt{a+b\text{ArcSin}(cx)}},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\text{ArcSin}(cx)}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]),x]
[Out] Defer[Int][1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}}\,dx = \int \frac{1}{(d+ex^2)\sqrt{a+b\sin^{-1}(cx)}}\,dx$$

Mathematica [A]
time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\text{ArcSin}(cx)}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]),x]
[Out] Integrate[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]), x]
```

Maple [A]
time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)\sqrt{a+b\arcsin(cx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^2*e + d)*sqrt(b*arcsin(c*x) + a)), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a + b \operatorname{asin}{\left(cx \right)}} \left(d + ex^{2}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*asin(c*x))*(d + e*x**2)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*sqrt(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)),x)
[Out] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)), x)
```

3.699 $\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\mathbf{ArcSin}(cx)}} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+ex^2)^2 \sqrt{a+b\text{ArcSin}(cx)}},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\text{ArcSin}(cx)}} dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]),x]
[Out] Defer[Int][1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}} dx = \int \frac{1}{(d+ex^2)^2 \sqrt{a+b\sin^{-1}(cx)}} dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b\text{ArcSin}(cx)}} dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]),x]
[Out] Integrate[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]), x]
```

Maple [A]
time = 1.41, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)^2 \sqrt{a+b\arcsin(cx)}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^2*e + d)^2*sqrt(b*arcsin(c*x) + a)), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a + b \operatorname{asin}{\left(c x \right)}} \left(d + e x^{2}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*asin(c*x))*(d + e*x**2)**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^2*sqrt(b*arcsin(c*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\sqrt{a+b\operatorname{asin}\left(c\,x\right)}\,\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2),x)
[Out] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2), x)
```

3.700 $\int \frac{d+ex^2}{(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=394

$$-\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{2d\sqrt{2\pi}\text{ co}}{}$$

[Out] -1/2*e*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/2*e*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/2*e*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3-1/2*e*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3-2*d*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/c+2*d*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c-2*d*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))^(1/2)-2*e*x^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))^(1/2)

Rubi [A]
time = 0.51, antiderivative size = 394, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.450$, Rules used = {4757, 4717, 4809, 3387, 3386, 3432, 3385, 3433, 4727}

$$\frac{\sqrt{\frac{\pi}{2}}e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{\sqrt{\frac{3\pi}{2}}e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}-\frac{\sqrt{\frac{\pi}{2}}e\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}+\frac{\sqrt{\frac{3\pi}{2}}e\cos\left(\frac{3a}{b}\right)S\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}+\frac{2\sqrt{2\pi}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2\sqrt{2\pi}d\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x])^(3/2),x]

[Out] (-2*d*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*e*x^2*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (2*d*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c) + (e*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) + (e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c^3) + (2*d*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) - (e*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c^3)

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
```

```
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{d+ex^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = \int \left(\frac{d}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}+\frac{ex^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\right)dx$$

$$= d\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx + e\int \frac{x^2}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2cd)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\sin \cdots}}}{b}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{(2d)\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx, x, \cdots\right.}{bc}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}} \cdots\right.}{bc}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{\left(4d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right) \cdots\right.}{b^2c \cdots}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}} - \frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+\cdots}}{\sqrt{\cdots}}\right.}{b^{3/2}c^3}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.70, size = 417, normalized size = 1.06

$$\frac{e^{-\frac{3i(a+b\text{ArcSin}(cx))}{b}}\left(ee^{\frac{3ia}{b}}-4c^2de^{\frac{3ia}{b}+2i\text{ArcSin}(cx)}-ee^{\frac{3ia}{b}+2i\text{ArcSin}(cx)}-4c^2de^{\frac{3ia}{b}+4i\text{ArcSin}(cx)}-ee^{\frac{3ia}{b}+4i\text{ArcSin}(cx)}+ee^{\frac{3i(a+2b\text{ArcSin}(cx))}{b}}+(4c^2d+e)e^{\frac{2ia}{b}+3i\text{ArcSin}(cx)}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+(4c^2d+e)e^{\frac{4ia}{b}+3i\text{ArcSin}(cx)}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)-\sqrt{3}\,ee^{3i\text{ArcSin}(cx)}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)-\sqrt{3}\,ee^{3i\left(\frac{2a}{b}+\text{ArcSin}(cx)\right)}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{3i(a+b\text{ArcSin}(cx))}{b}\right)\right)}{4bc^3\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (e*E^(((3*I)*a)/b) - 4*c^2*d*E^(((3*I)*a)/b + (2*I)*ArcSin[c*x]) - e*E^(((3
*I)*a)/b + (2*I)*ArcSin[c*x]) - 4*c^2*d*E^(((3*I)*a)/b + (4*I)*ArcSin[c*x])
 - e*E^(((3*I)*a)/b + (4*I)*ArcSin[c*x]) + e*E^(((3*I)*(a + 2*b*ArcSin[c*x]
))/b) + (4*c^2*d + e)*E^(((2*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b
*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + (4*c^2*d + e)*
E^(((4*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1
/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*e*E^((3*I)*ArcSin[c*x])*Sqrt[((-I)
*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[
3]*e*E^((3*I)*((2*a)/b + ArcSin[c*x]))*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b])/(4*b*c^3*E^(((3*I)*(a + b*ArcSin[c*x
]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.41, size = 460, normalized size = 1.17

method	result
default	$\frac{4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}\,\cos\left(\frac{a}{b}\right)\mathrm{S}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(cx\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c^{2}d+4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c^3/b*(4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)
*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^2*d+4*
(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(
1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*c^2*d+(-1/b)^(1/2)*Pi
^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(
-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e+(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b
*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*ar
csin(c*x))^(1/2)/b)*e-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)
*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*e-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*Fre
snelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e-4*cos(-(
a+b*arcsin(c*x))/b+a/b)*c^2*d+cos(-3*(a+b*arcsin(c*x))/b+3*a/b)*e-cos(-(a+b
*arcsin(c*x))/b+a/b)*e)/(a+b*arcsin(c*x))^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((x^2*e + d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{d + ex^2}{(a + b\,\mathrm{asin}\,(cx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((d + e*x**2)/(a + b*asin(c*x))**(3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{e\,x^2 + d}{{\left(a + b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)/(a + b*asin(c*x))^(3/2),x)
```

```
[Out] int((d + e*x^2)/(a + b*asin(c*x))^(3/2), x)
```

3.701 $\int \frac{1}{(a+b\textbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=137

$$-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}-\frac{2\sqrt{2\pi}\,\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}+\frac{2\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{A}\cdots}}{\sqrt{b}}\right.\cdots}{b^{3/2}c}$$

```
[Out] -2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1
/2)*Pi^(1/2)/b^(3/2)/c+2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c-2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*
arcsin(c*x))^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.583$, Rules used = {4717, 4809, 3387, 3386, 3432, 3385, 3433}

$$\frac{2\sqrt{2\pi}\,\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2\sqrt{2\pi}\,\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\text{ArcSin}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcSin[c*x])^(-3/2),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*Sqrt[2*Pi]*Cos[a/
b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c) + (2
*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b]
)/(b^(3/2)*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{1}{\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx=-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{(2c)\int \frac{x}{\sqrt{1-c^2x^2}\,\sqrt{a+b\sin^{-1}(cx)}}\,dx}{b}$$

$$=-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{2\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{bc}$$

$$=-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}+x\right)}{\sqrt{a+bx}}\,dx,x,\sin^{-1}(cx)\right)}{bc}+ - \ (\ldots$$

$$=-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{\left(4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\sin^{-1}(cx\ldots}\right.}{b^2c}\ldots$$

$$=-\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\sin^{-1}(cx)}}-\frac{2\sqrt{2\pi}\,\cos\left(\frac{a}{b}\right)S\left(\frac{\sqrt{\frac{2}{\pi}}\,\sqrt{a+b\sin^{-1}(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}+\frac{2\sqrt{2\ldots}}{\ldots}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.21, size = 167, normalized size = 1.22

$$\frac{e^{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\left(e^{i\text{ArcSin}(cx)}\sqrt{-\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},-\frac{i(a+b\text{ArcSin}(cx))}{b}\right)+e^{\frac{ia}{b}}\left(-1-e^{2i\text{ArcSin}(cx)}+e^{\frac{i(a+b\text{ArcSin}(cx))}{b}}\sqrt{\frac{i(a+b\text{ArcSin}(cx))}{b}}\,\text{Gamma}\left(\frac{1}{2},\frac{i(a+b\text{ArcSin}(cx))}{b}\right)\right)\right)}{bc\sqrt{a+b\text{ArcSin}(cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcSin[c*x])^(-3/2),x]
```

```
[Out] (E^(I*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a +
 b*ArcSin[c*x]))/b] + E^((I*a)/b)*(-1 - E^((2*I)*ArcSin[c*x]) + E^((I*(a +
b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*Arc
Sin[c*x]))/b]))/(b*c*E^((I*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A]
time = 0.12, size = 158, normalized size = 1.15

method	result

default	$-\frac{2\left(-\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\mathrm{S}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-\sqrt{a+b\arcsin(cx)}\,\mathrm{si}}{cb\sqrt{a+b\arcsin(cx)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/c/b/(a+b*arcsin(c*x))^(1/2)*(-(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(
2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1
/2)*2^(1/2)-(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/
b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+cos(-(a+b
*arcsin(c*x))/b+a/b))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(-3/2), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a+b\operatorname{asin}(cx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**(-3/2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^(-3/2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*asin(c*x))^(3/2),x)
[Out] int(1/(a + b*asin(c*x))^(3/2), x)
```

3.702 $\int \frac{1}{(d+ex^2)(a+b\textbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))^{3/2}},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)\,(a+b\sin^{-1}(cx))^{3/2}}\,dx = \int \frac{1}{(d+ex^2)\,(a+b\sin^{-1}(cx))^{3/2}}\,dx$$

Mathematica [A]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)\,(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A]
time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)\,(a+b\arcsin(cx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^2*e + d)*(b*arcsin(c*x) + a)^(3/2)), x)
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a + b\operatorname{asin}(cx))^{\frac{3}{2}}(d + ex^2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**(3/2)*(d + e*x**2)), x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^(3/2)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(a+b\operatorname{asin}\left(c\,x\right)\right)^{3/2}\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)),x)
[Out] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)), x)
```

3.703 $\int \frac{1}{(d+ex^2)^2(a+b\mathbf{ArcSin}(cx))^{3/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^{3/2}},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^2)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx = \int \frac{1}{(d+ex^2)^2\left(a+b\sin^{-1}(cx)\right)^{3/2}}\,dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex^2)^2(a+b\text{ArcSin}(cx))^{3/2}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [A]
time = 1.56, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\,x^2+d)^2\,(a+b\arcsin(cx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^2*e + d)^2*(b*arcsin(c*x) + a)^(3/2)), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + b \operatorname{asin}\left(cx\right)\right)^{\frac{3}{2}} \left(d + ex^{2}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral(1/((a + b*asin(c*x))**(3/2)*(d + e*x**2)**2), x)
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:Evaluation time: 1.93Not invertible Error: Bad Argument V
alue
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^{3/2}\,{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)^2),x)
```

```
[Out] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)^2), x)
```

Chapter 4

Appendix

Local contents

4.1 Download section 3466
4.2 Listing of Grading functions 3466

4.1 Download section

The following zip files contain the raw integrals used in this test.

Mathematica format Mathematica_syntax.zip

Maple and Mupad format Maple_syntax.zip

Sympy format SYMPY_syntax.zip

Sage math format SAGE_syntax.zip

4.2 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.2.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                       Small rewrite of logic in main function to make it*)
(*                       match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)
```

```
GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leafC
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A","none"}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count
                  ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A","none"}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal. $
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "<
            ,
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
```

```
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
```

```
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.2.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issues
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);
```

```
        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A","";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of re
                                  convert(leaf_count_result,string)," vs. $2 (",
                                  convert(leaf_count_optimal,string)," ) = ",convert(2*leaf_co
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
```

```
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well"
            fi;
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A","";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of o
                               convert(leaf_count_result,string),"$ vs. $2(",
                               convert(leaf_count_optimal,string),")=",convert(2*leaf_cou
            fi;
        fi;
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
```

```
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
```

```
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.2.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#             Port of original Maple grading function by
#             Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#             added 'exp_polar'
from sympy import *

def leaf_count(expr):
   #sympy do not have leaf count function. This is approximation
   return round(1.7*count_ops(expr))

def is_sqrt(expr):
   if isinstance(expr,Pow):
      if expr.args[1] == Rational(1,2):
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
         asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
         asinh,acosh,atanh,acoth,asech,acsch
      ]

def is_special_function(func):
   return func in [ erf,erfc,erfi,
          fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
          gamma,loggamma,digamma,zeta,polylog,LambertW,
          elliptic_f,elliptic_e,elliptic_pi,exp_polar
       ]

def is_hypergeometric_function(func):
   return func in [hyper]

def is_appell_function(func):
   return func in [appellf1]

def is_atom(expn):
   try:
      if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
        return True
      else:
        return False
```

```
    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnT
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
```

```
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is larger
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(lea
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType_re
```

```
    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

    return grade, grade_annotation
```

4.2.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#          Albert Rich to use with Sagemath. This is used to
#          grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#          'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#          issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    #print("Enter tree_size, expr is ",expr)

    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:    #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False
```

```
def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
            'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
            'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
            'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
            'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']    #[appellf1] can't find this in sagemath
```

```
def is_atom(expn):

   #debug=False
   if debug:
       print ("Enter is_atom, expn=",expn)

   if not hasattr(expn, 'parent'):
      return False


   #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-
   try:
      if expn.parent() is SR:
         return expn.operator() is None
      if expn.parent() in (ZZ, QQ, AA, QQbar):
         return expn in expn.parent() # Should always return True
      if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
         return expn in expn.parent().base_ring() or expn in expn.parent().gens()

      return False

   except AttributeError as error:
      print("Exception,AttributeError in  is_atom")
      print ("cought exception" , type(error).__name__ )
      return False


def expnType(expn):

   if debug:
      print (">>>>>Enter expnType, expn=", expn)
      print (">>>>>is_atom(expn)=", is_atom(expn))

   if is_atom(expn):
      return 1
   elif type(expn)==list:   #isinstance(expn,list):
      return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
   elif  is_sqrt(expn):
      if  type(expn.operands()[0])==Rational:  #type(isinstance(expn.args[0],Rational):
         return 1
      else:
         return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
   elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
      if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
         return expnType(expn.operands()[0])    #expnType(expn.args[0])
      elif type(expn.operands()[1])==Rational:   #isinstance(expn.args[1],Rational)
         if type(expn.operands()[0])==Rational:  #isinstance(expn.args[0],Rational)
```

```
            return 1
         else:
            return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
      else:
         return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))  #max(3,expnType(expn.op
   elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstan
      m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
      m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
      return max(m1,m2)   #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
   elif is_elementary_function(expn.operator()):   #is_elementary_function(expn.func)
      return max(3,expnType(expn.operands()[0]))
   elif is_special_function(expn.operator()): #is_special_function(expn.func)
      m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
      return max(4,m1)    #max(4,m1)
   elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
      m1 = max(map(expnType, expn.operands()))        #max(map(expnType, list(expn.args)))
      return max(5,m1)    #max(5,m1)
   elif is_appell_function(expn.operator()):
      m1 = max(map(expnType, expn.operands()))        #max(map(expnType, list(expn.args)))
      return max(6,m1)    #max(6,m1)
   elif str(expn).find("Integral") != -1: #this will never happen, since it
            #is checked before calling the grading function that is passed.
            #but kept it here.
      m1 = max(map(expnType, expn.operands()))        #max(map(expnType, list(expn.args)))
      return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
   else:
      return 9

#main function
def grade_antiderivative(result,optimal):


   if debug:
      print ("Enter grade_antiderivative for sagemath")
      print("Enter grade_antiderivative, result=",result)
      print("Enter grade_antiderivative, optimal=",optimal)
      print("type(anti)=",type(result))
      print("type(optimal)=",type(optimal))

   leaf_count_result  = tree_size(result) #leaf_count(result)
   leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

   #if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)



   expnType_result  = expnType(result)
   expnType_optimal = expnType(optimal)
```

```
if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
    if result.has(I):
        if optimal.has(I): #both result and optimal complex
            if leaf_count_result <= 2*leaf_count_optimal:
                grade = "A"
                grade_annotation ="none"
            else:
                grade = "B"
                grade_annotation ="Both result and optimal contain complex but leaf count of result is larger t
        else: #result contains complex but optimal is not
            grade = "C"
            grade_annotation ="Result contains complex when optimal does not."
    else: # result do not contain complex, this assumes optimal do not as well
        if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
        else:
            grade = "B"
            grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(leaf_
else:
    grade = "C"
    grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_resu


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```